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SYSTEM MANUAL

U.S. NAVY TRANSPORTABLE COMMUNICATION SYSTEM AN/TSC-35

VOLUME III OF III

TRANSMITTING CENTRAL AN/TST-2

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SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the Bureau of Ships Manual or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While all practicable safety precautions have been incorporated in this equipment, the following rules must be strictly observed.

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions, dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties, always remove power and discharge circuits prior to touching them.

DO NOT SERVICE OR ADJUST ALONE:

Under no circumstances should any person reach within or enter an enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DO NOT TAMPER WITH PROTECTIVE COVERS:

Panels of equipment carrying high voltages are fitted with doors or removable protective covers. Under no circumstance should any protective cover be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel. All protective covers should be replaced immediately upon completion of the maintenance operation which required their removal.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION SHOULD BE PROMINENTLY DISPLAYED IN EACH ROOM. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

PREFACE

This volume contains a detailed description of Transmitting Central AN/TST-2 containers, installation details of the antennas, RF distribution system, ground system and primary power cabling, and a description of special circuits and transmitter modifications.

VOLUME III
TRANSMITTING CENTRAL AN/TST-2

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TRANSMITTING CENTRAL AN/TST-2

SECTION I
DESCRIPTION OF CONTAINERS

1-1. INTRODUCTION.

Transmitting Central AN/TST-2 is a straight-forward transmitter station providing both balanced and unbalanced feed to antennas from high-frequency transmitters, and balanced or single-wire feed from low-frequency transmitters. Communication with the controlling Receiving Central is through a CCL system comprised of microwave and terminal equipment which provides channel facilities for all transmitter circuits. The CCL system is equipped with a baseband order-wire. All transmitters and associated equipment, and repair, supply and primary power facilities are housed in transportable 40-foot containers.

1-2. The Transmitting Central complex is comprised of thirty containers positioned as shown in figure 1-1 and a helix container that is located near a low-frequency antenna in the antenna field. Twenty containers house communication transmitters, two contain RF distribution facilities, one houses repair and supply facilities, one is equipped for transmitter control, and six contain the primary AC power plant.

1-3. An interior ground bus consisting of a copper bus bar is installed in the deck of each Transmitting Central container. All equipment racks and the AC power neutral in each container are connected to the interior ground bus. At the site, the ground bus is connected to an earth ground system as described in section 2 of this volume.

1-4. High-frequency communication transmitters installed in the Transmitting Central containers include ten AN/URT-19(V)'s, thirty-seven AN/FRT-39D's, sixteen AN/FRT-40B's and one AN/FRT-62. Low-frequency communication transmitters installed include two TAB-7's, one AN/FRT-19, and one AN/FRT-61. All of the high frequency transmitters have been modified to some extent, both mechanically and electrically, to provide greater flexibility of operation in the AN/TSC-35 communication system. The electrical modifications are described in section 3 of this volume.

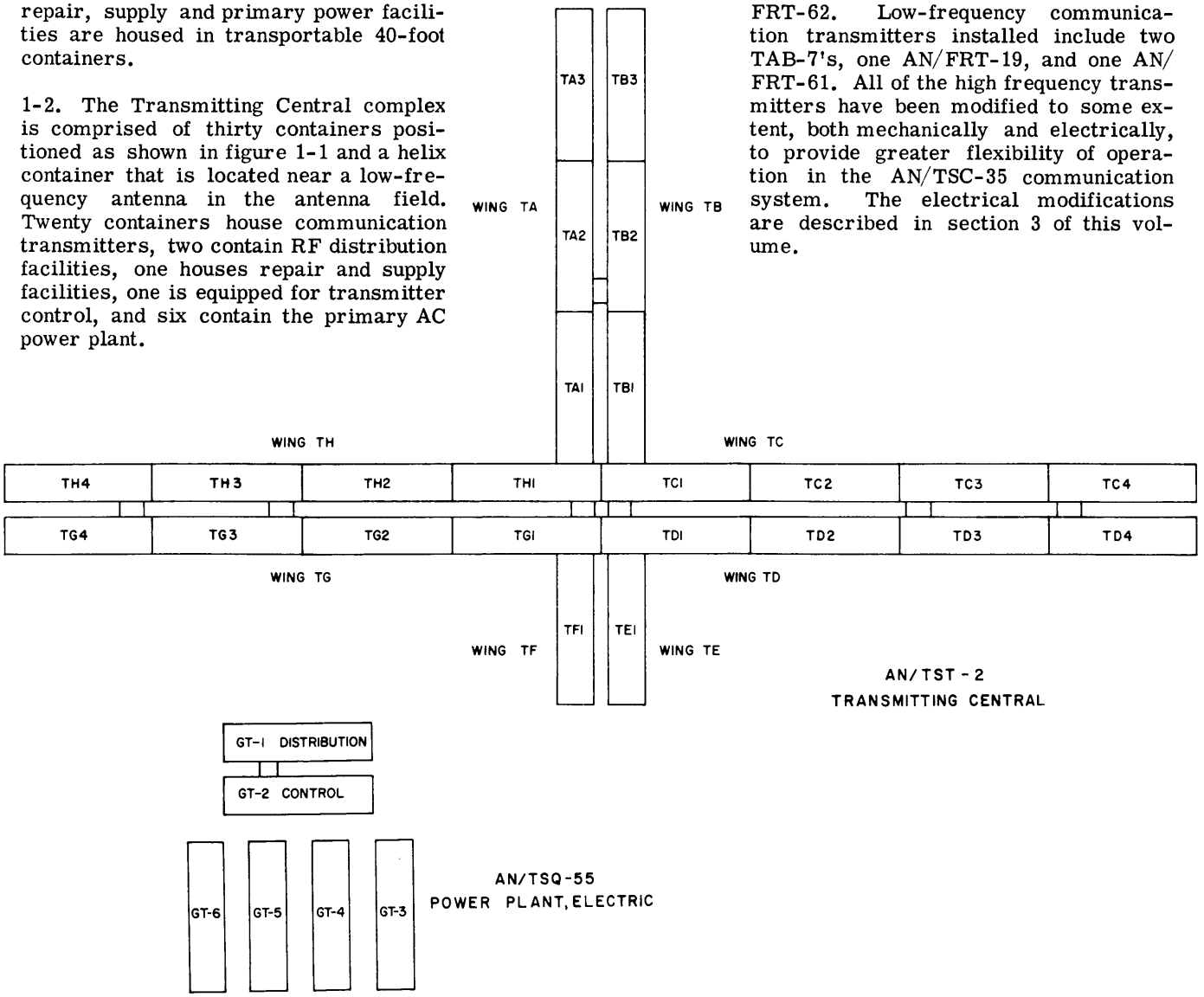


Figure 1-1. Site Plan, Transmitting Central AN/TST-2 Containers

1-5. Construction details of the containers are discussed in Section 1, Volume 1 of this manual. The following paragraphs describe the equipment installation in the Transmitting Central containers.

1-6. CONTROL-MONITOR GROUP OA-4915/TST-2.

Control-Monitor Group OA-4915/TST-2, container TC1 (see figures 1-2 and 1-3) is the transmitter control area at the Transmitting Central. This container houses DC and audio patch panels, main distribution frames, monitor and alarm facilities, and the station frequency standard. It also houses the microwave and terminal equipment comprising the CCL system. Side doors are provided at the rear that connect with container TB1 on the left, and with a side-to-side walkway into container TD1 on the right. One air conditioning unit is installed on the left outside wall.

1-7. Rack positions TC1.5 and TC1.7 contain the audio patch and main distribution frame (MDF). Rack position TC1.11 contains the TD-410/UGC multiplexers that are utilized primarily with transmitters on point-to-point circuits. Rack position TC1.9 contains an R-390A/URR receiver used for transmitter monitoring. Rack positions TC1.13 and TC1.15 contain the DC patch and MDF. Rack position TC1.17 contains a 12-channel, full-duplex AN/FGC-60/29 telegraph terminal, and rack position TC1.19 contains a 24-channel, receive AN/FGC-60/23B telegraph terminal. The MDF's and the telegraph terminal equipment are described in volume 1 of this manual.

1-8. Rack positions TC1.21 through TC1.33 contain the TH-39/UGT units which have been removed from the AN/URT-19(V), AN/FRT-39D, AN/FRT-40B and AN/FRT-62 transmitters.

1-9. A desk and shelf are mounted on the right sidewall of the container. The INTERCOM unit on the shelf above the desk is inter-connected to the power control container GT2. A circuit breaker panel is provided which controls the AC power for all functions of the container. It is wall-mounted beside rack position TC1.6.

1-10. Rack position TC1.6 contains the alarm panels which by lights and a bell indicate the status of all transmitters within the complex. Also contained in this rack are two TT-176A/UG TTY machines. The top unit is interconnected through the CCL system to the station internal order-wire system at the Receiving Central. The Lower TT-176A/UG is a spare unit.

1-11. Rack position TC1.8 contains the model VLFC-1 station frequency standard and the SPP-30416 RF patch panels which terminate the RF monitor coaxial cables extended through the signal ductwork from each transmitter. Rack position TC1.10 is provided for the future installation of test or monitor equipment. Rack position TC1.12 contains the remote control units for the rotatable log-periodic antennas.

1-12. Rack positions TC1.22 and TC1.24 contain the microwave equipment for the CCL system. A microwave antenna is mounted on the roof of the container over these rack positions. Rack positions TC1.26, TC1.28 and TC1.30 contain the AN/FCC-17 voice terminal equipment which is used with the microwave equipment to form the CCL system. Rack position TC 1.32 contains an AN/GRT-3 UHF transmitter and an AN/URR-35C UHF receiver which provides for emergency communications to the Receiving Central and acts as a standby unit for the UHF equipment located at the receiving site.

1-13. Signal ductwork, consisting of 4 x 12 cable duct on both walls that are connected with a transverse section at the rear, feed cables through special scoop fittings into the tops of both MDF's and rack position TC1.6. A CO_2 fire extinguisher, supported on a wall-mounted bracket, is installed on the left rear wall of the container.

1-14. RADIO TRANSMITTING SET AN/TRT-17.

Radio Transmitting Set AN/TRT-17 houses five model AN/FRT-39D transmitters. Containers TA1, TA2, TB2, TB3, TC4, TD4 and TG2, positioned in the Transmitting Central complex as shown in figure 1-1, are model AN/TRT-17 Transmitting Sets. Each AN/TRT-17 container is equipped with two air-conditioning units that are mounted on the wall facing outboard in the complex. A wall-mounted CO_2 fire extinguisher is installed in each container, and a 24-hour clock is provided for containers TC4 and TD4.

1-15. The AN/TRT-17 containers are similar in construction and equipment layout with only minor variations in ventilation ducts due to location of side doors, and differences in the size of signal duct due to cable loading requirements in their respective wings. The AN/TRT-17 containers may also be considered as two groups in which the containers in one group are practically mirror images of the containers in the second group. In the first group that includes containers TA1, TA2, TC4 and TG2 (see figure 1-4), the transmitters are mounted facing the left wall of the container while in the second group comprised of containers TB2, TB3 and TD4, (see figure 1-5) the transmitters face the right wall of the container. Containers TA2, TB2, TC4 and TD4 have side doors near the rear of the containers, while TA1, TB3 and TG2 are type 2 containers without side doors. A side-to-side walkway is installed between containers TA2 and TB2, and another between containers TC4 and TD4.

1-16. MODEL AN/FRT-39D TRANSMITTER.

The AN/FRT-39D is a synthesized, 10-kilowatt (PEP) single-sideband transmitter that operates in the frequency range of 2 to 28 megacycles. Frequency stability of the transmitter is one part in 10^8 per day. Modes of operation include SSB, ISB, FSK, FAX, AM and CW. In emergencies or when low power output is desired, the intermediate power amplifier of the transmitter may be used to provide a 1-kilowatt (PEP) output. For full power output, the transmitter requires a primary power input of approximately 15-kilowatts at 208/230 volts AC, 3-phase, 50 to 60 cps. Each AN/FRT-39D transmitter has provisions for both balanced or unbalanced output.

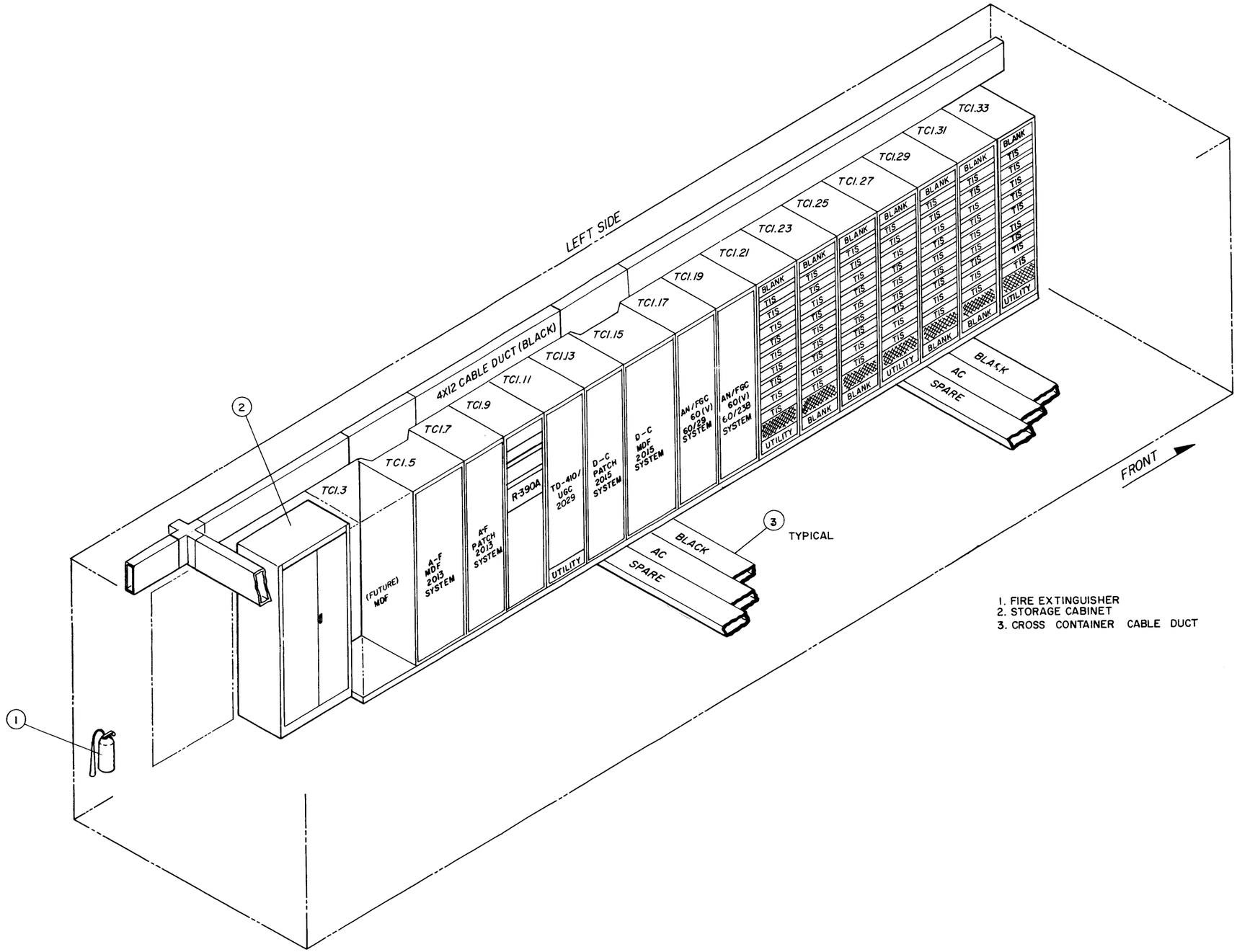
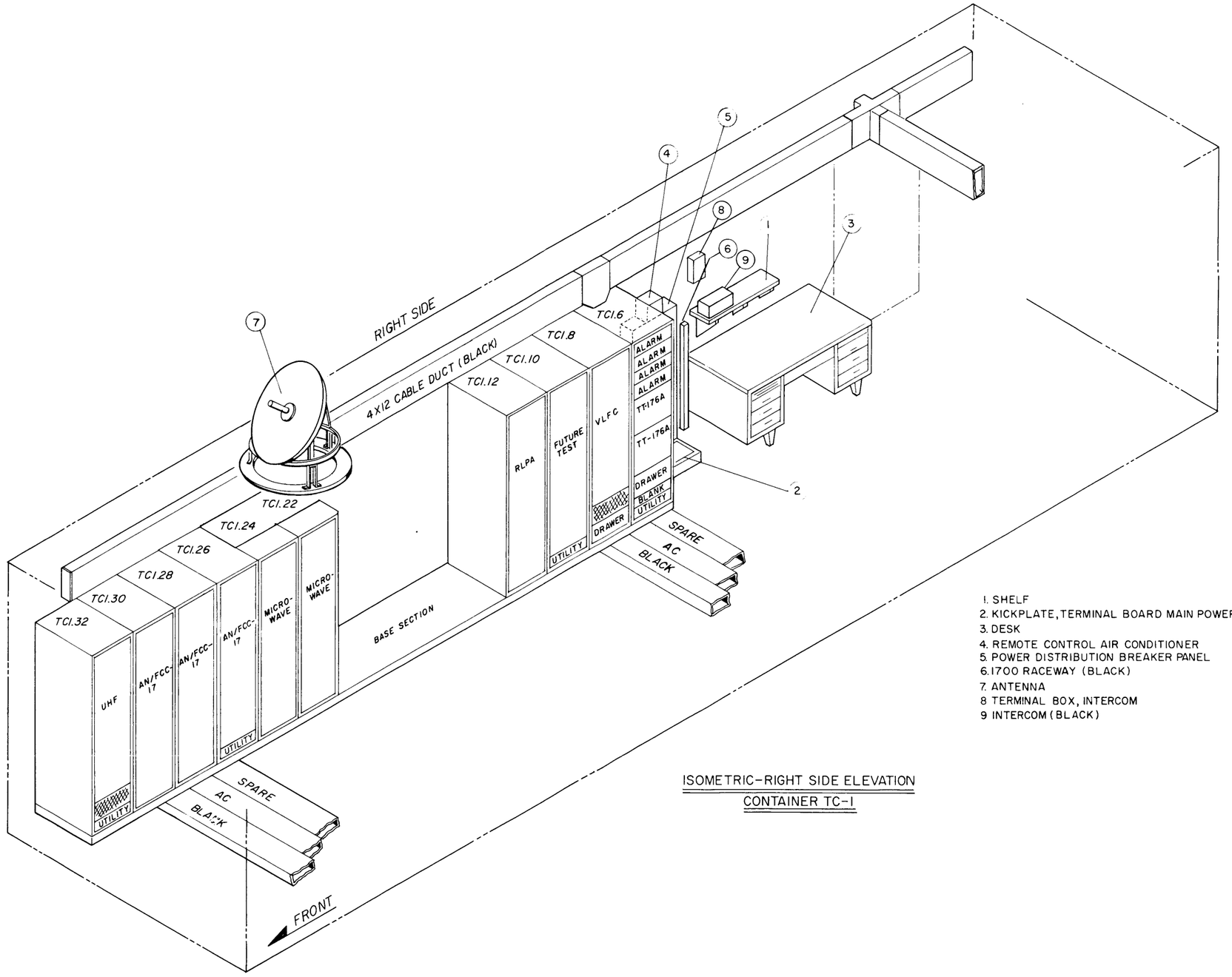


Figure 1-2. Control-Monitor Group OA-4915/TST-2 (Container TC1, Left Side) Isometric View



ISOMETRIC–RIGHT SIDE ELEVATION
CONTAINER TC-1

Figure 1-3. Control-Monitor Group OA-4915/TST-2 (Container TC1, Right Side) Isometric View

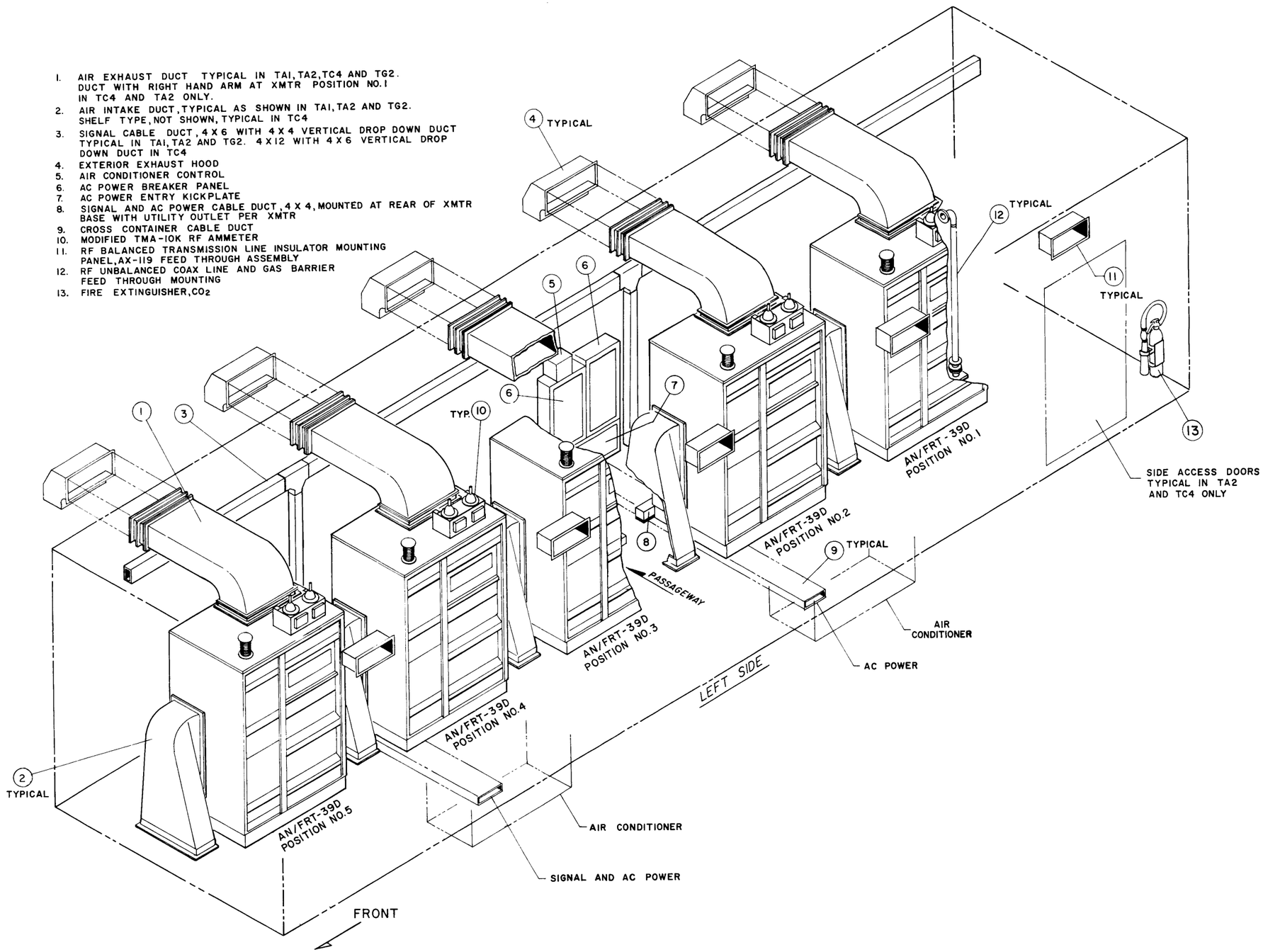


Figure 1-4. Radio Transmitting Set AN/TRT-17 (Typical of TA1, TA2, TC4, and TG2) Isometric View

1. AIR EXHAUST DUCT, TYPICAL TB2, TB3 AND TD4
2. AIR EXHAUST DUCT WITH LEFT HAND ARM, TYPICAL IN TB2 AND TD4 ONLY
3. EXTERIOR EXHAUST HOOD
4. SIGNAL CABLE DUCT, 4 X 6 DUCT WITH 4 X 4 VERTICAL DROP DOWN DUCT TYPICAL IN TB2 AND TB3. 4 X 12 DUCT WITH 4 X 6 VERTICAL DROP DOWN DUCT IN TD4
5. AIR CONDITIONER CONTROL
6. AC POWER BREAKER PANELS
7. AC POWER ENTRY KICKPLATE
8. SIGNAL AND AC POWER CABLE DUCT, 4 X 4, MOUNTED AT REAR OF XMTR BASE WITH UTILITY OUTLET PER XMTR
9. CROSS CONTAINER CABLE DUCT
10. MODIFIED TMA-10K RF AMMETER
11. RF BALANCED TRANSMISSION LINE INSULATOR BOWL MOUNTING PANEL, AX-159 FEED THROUGH ASSEMBLY
12. RF, UNBALANCED, COAX TRANSMISSION LINE
13. AIR INTAKE DUCT
14. AIR CONDITIONER RECEPTACLE MOUNTING
15. FIRE EXTINGUISHER, CO_2

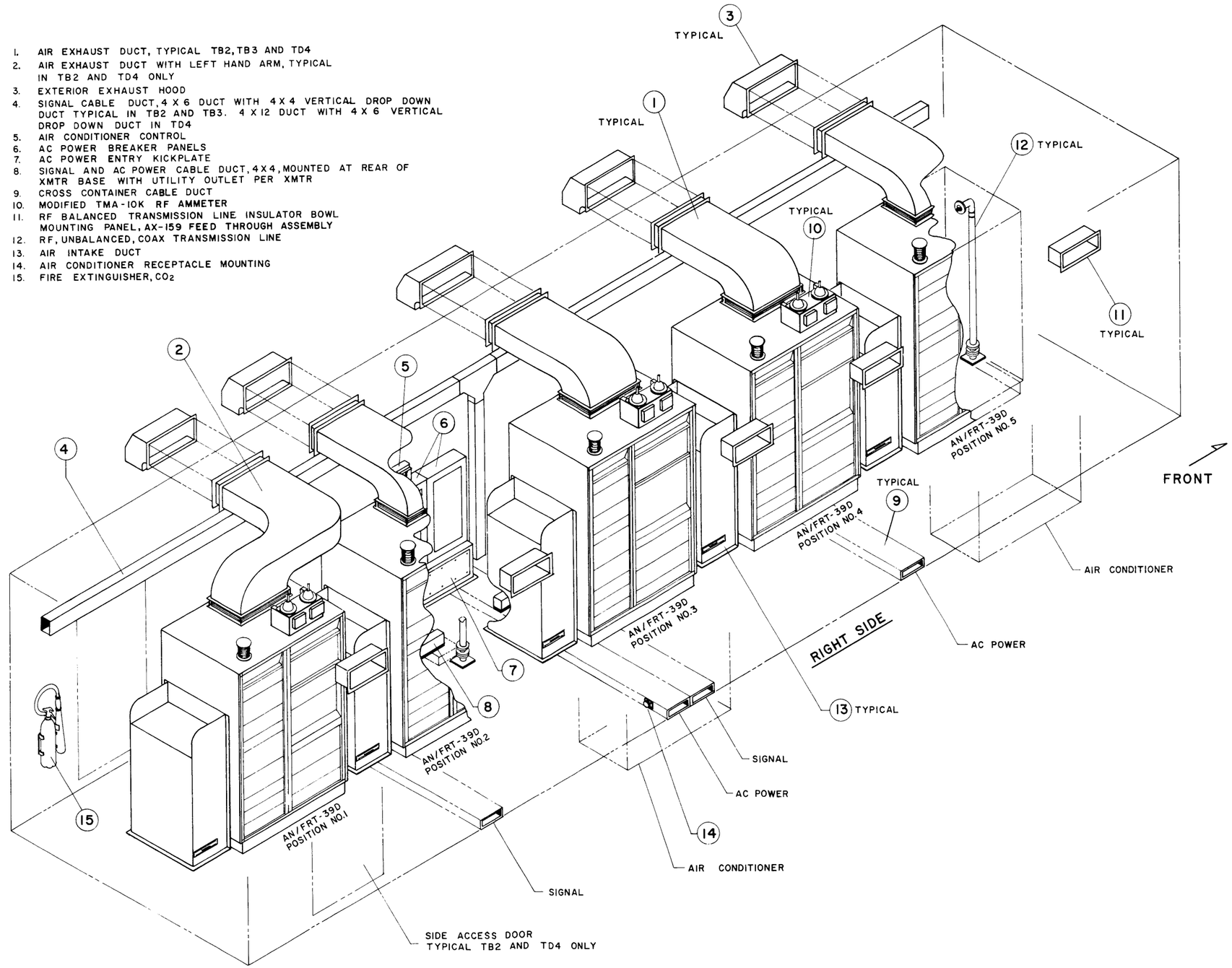


Figure 1-5. Radio Transmitting Set AN/TRT-17 (Typical of TB2, TB3, and TD4) Isometric View

1-17. The AN/FRT-39D transmitter (see figure 1-6) consists of an auxiliary frame on the left and a main frame on the right that are housed in a metal cabinet mounted on a common base. The auxiliary frame contains the components of an AN/URA-30A Oscillator-Monitor Group. The main frame contains an intermediate power amplifier, a 10-kilowatt (PEP) linear power amplifier, a high-voltage power supply and the transmitter power control panel. The front doors of the standard AN/FRT-39D transmitter have been removed, and the standard hinged rear doors have been replaced with rear skins which are equipped with quick-disconnect fasteners. A modified TMA-10K RF ammeter is mounted on the top of the main frame. The ammeter measures the RF current in each leg of a transmission line when the transmitter is connected for balanced operation.

1-18. The TH-39A/UGT (TIS-3) unit, normally mounted in the auxiliary frame of the AN/FRT-39D transmitter, has been removed and relocated in Control Monitor Group OA-4915/TST-2 Transmitter Control container TC1. The cabinet wiring to the TH-39A/UGT is terminated on a fanning strip mounted at the rear of the exciter frame. The PP-2561A power supply (CPP-1) unit, normally mounted at the rear of the auxiliary frame, has been relocated to the front of the frame in the space vacated by the TH-39A/UGT.

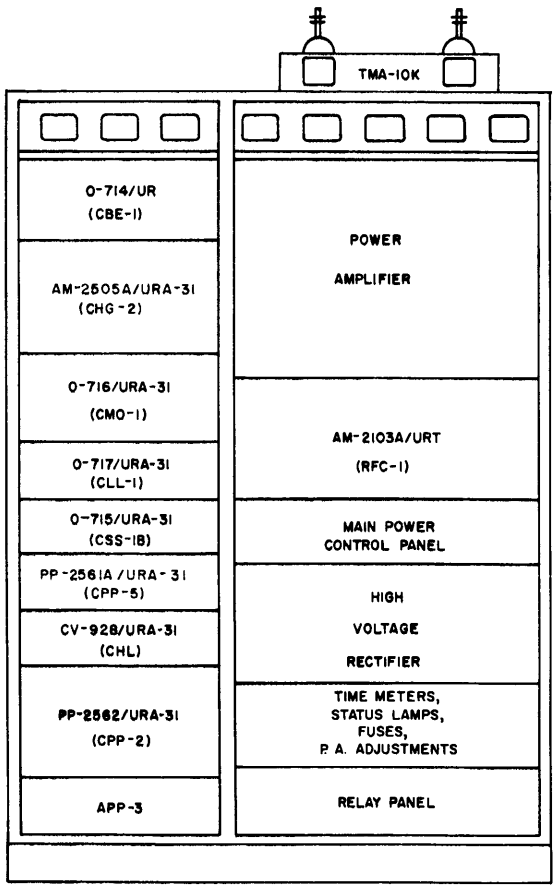


Figure 1-6. AN/FRT-39D Transmitter, Front Elevation

1-19. The AM-2505 (CHG-2) unit in the auxiliary frame has been modified by the addition of a relay in the B+ line. This modification provides push-to-talk keying for voice operation from a remote location.

1-20. The radiation indicator circuit of each AN/FRT-39D transmitter is extended to an RF distribution container (TD1 or TG1) and to the transmitter control container TC1 by the addition of a 12-volt step-down transformer across the primary power input to the transmitter. When high voltage is applied to the transmitter, the transformer provides 12 volts AC that activates remote radiation indicators in the RF distribution and the transmitter control containers.

1-21. The transmitter interlock circuit is extended to an RF patch panel in an RF distribution container (TD1 or TG1). The RF monitor circuit on the auxiliary power panel (APP-3) is extended to the transmitter control container TC1. The utility outlets on the auxiliary power panel are furnished AC power from a separate circuit breaker on the container power distribution panel.

1-22. The wiring changes necessitated by the above modifications to the transmitters are described in section 3 of this volume.

1-23. The transmitters are installed down the center of the container (see figures 1-4 and 1-5) allowing maintenance access from both the front and the rear of the equipment. The transmitter mounting bases are secured with bolts to steel tapping plates that are installed in the floors of the containers. Signal and power wiring to the transmitters is carried in cross-container ducts which feed into 4 x 4 cable duct that is floor-mounted flush against the mounting bases at the rear of the transmitters. The transmitter frames are grounded to the container ground bus bar with a 2-inch copper strap in the auxiliary frame.

1-24. A balanced RF output connecting from each transmitter is made with a section of 600-ohm balanced line from the terminals of the modified TMA-10K RF ammeter, mounted on the transmitter main frame, to an AX-159 feed-through assembly installed in the outboard wall of the container. The feed-through assemblies are mounted on box-like panels which are installed in cut-outs in the container walls near the ceiling. The panels are recessed into the container from the outside to prevent the feed-through connections from protruding beyond the outer skin of the container. An external rain-tight cover is provided for each box to protect the bowl assemblies when not in use.

1-25. The unbalanced RF output of the AN/FRT-39D transmitter is located on the right side and near the top of the main frame. The unbalanced output connects through a section of rigid 1 5/8-inch coaxial line to a feed-through coaxial fitting installed in the floor of the container. The feed-through fitting is equipped with a gas barrier on the inside and with a type 87R flange under the floor of the container. The type 87R flange connects to an HJ7-50, 1 5/8-inch air-dielectric, flexible coaxial cable that is terminated at an RF dis-

tribution panel in one of the RF distribution containers TD1 or TG1. The flexible coaxial cables are pressurized with dry air by dehydrators installed in the RF distribution containers.

1-26. VENTILATION DUCTS.

The transmitter intake ventilation ducts are mounted on the left side of the transmitters connecting to air intake cut-outs in the container floor. The intake ventilation ducts are equipped with removable dust filters that slip into the ducts from the front just above the floor level. The filters are re-usable and may be cleaned by first removing heavy dirt with forced air then washing with solvent or detergent.

1-27. The flared transmitter intake ventilation ducts illustrated in figure 1-4 are installed in containers TA1, TA2 and TG2. The shelf-type intake ventilation ducts illustrated in figure 1-5 are installed in containers TB2, TB3, TC4 and TD4.

1-28. The transmitter exhaust ventilation ducts connect the exhaust port on the top of each transmitter to an exhaust cut-out on the upper inboard wall of the container. On the outside of the container, the cut-outs are protected with screened exterior exhaust hoods which prevent rain and foreign material from getting into the transmitter.

1-29. Curved exhaust ventilation ducts are installed on the transmitters in position 1 in containers TA2, TB2, TC4 and TD4. (See figure 1-5). The exhaust cut-outs for these transmitters are located forward of the transmitters because sidewall reinforcement installed around the side doors of the containers. The remaining AN/TRT-17 containers have no side doors and the straight exhaust ventilation duct illustrated in figure 1-4 is used at the transmitter positions of these containers.

1-30. SIGNAL DUCT AND CABLE INSTALLATION.

The inter-container signal cable duct in all AN/TRT-17 containers is wall-mounted behind the transmitters just below the exhaust ventilation ducts, as shown in figures 1-4 and 1-5. 4 x 6 cable duct is provided in containers TA1, TA2, TB2, TB3 and TG2, and 4 x 12 duct is used in container TC4 and TD4. Vertical 4 x 6 duct sections join the 4 x 12 wall-mounted duct with cross-container duct in TC4 and TD4, and in the remaining AN/TRT 17 containers, the wall-mounted 4 x 6 duct is connected with the cross-container ducts through vertical 4 x 4 duct sections. The center cross-container duct feeds the cables into a 4 x 4 duct that is installed on the floor flush against the rear of transmitter bases in positions 3, 4 and 5. The rear cross-container duct connects with a similar 4 x 4 duct at the rear of transmitter positions 1 and 2.

1-31. The 4 x 12 duct in containers TC4 and TD4 is fitted with transition pieces that raise the duct level to ceiling height at both ends of the containers in order to clear the container side doors. The 4 x 6 duct in the remaining AN/TRT-17 containers is run in a straight line since the height of the duct is sufficient to clear the doors.

1-32. Inter-container cables installed for each AN/FRT-39D transmitter are a 4-pair shielded signal cable to the MDF's in container TC1, a 4-wire external-interlock and radiation-indicator cable to an RF distribution patch panel (container TD1 or TG1), and an RG-58/U coaxial cable to the RF monitor patch panel in container TC1. The cables are pulled through the rear of the transmitter bases into the 4 x 4 duct, then through cross-container duct and vertical duct into the wall-mounted duct towards the rear of the container. Each cable is cut and terminated in a connector inside the wall-mounted duct, then extended to its respective termination when the container is installed on site. Type MS-3101A connectors are used for the 4-pair and 4-wire cables, and BNC type connectors for the RG-58/U coax.

1-33. POWER CABLING.

Two power distribution panels are installed on the inboard wall of each AN/TRT-17 container between the transmitters in positions 2 and 3. The panels house circuit breakers for all transmitters, the air conditioners, lighting, utility outlets and the air conditioner control unit. The kickplate area below the power panels contains a power terminal board and two stuffing tubes for bringing primary AC power cables into the container.

1-34. The transmitter power cables from the circuit breakers are run through the kickplate into the cross-container duct and into the 4 x 4 duct behind the transmitters where they enter the transmitter mounting bases. An AC utility outlet is installed on the 4 x 4 duct behind each transmitter. The air-conditioner power and control cables are run in the cross-container ducts at the locations of the air conditioner units, then terminated in a receptacle fastened to the side of the duct as shown in figure 1-5. An air-conditioner control unit, which controls both air conditioning units, is mounted on the left power distribution panel.

1-35. RADIO TRANSMITTING SET AN/TRT-18.

Radio Transmitting Set AN/TRT-18 houses two model AN/FRT-40B transmitters. Containers TB1, TC2, TC3, TD2, TD3, TH1 and TG3 are model AN/TRT-18 Transmitting Sets, and are positioned in the Transmitting Central complex as shown in figure 1-1. Two air conditioning units are provided for each AN/TRT-18 container. The air conditioners are mounted on the outboard wall of the containers. A CO_2 fire extinguisher, supported on a wall-mounted bracket, is installed at the rear of each container. A 24- hour clock is provided in TG3. Side doors are provided at the rear of containers TC3, TD3, TG3 and TH1.

1-36. The AN/TRT-18 containers are similar in construction and equipment layout with minor differences in intake ventilation ducts, and some differences in cable duct which will be pointed out in subsequent paragraphs. The transmitters in containers TB1, TD2, TD3 and TH1 (see figure 1-7) are mounted facing the right wall of the containers, and the transmitters in TC2, TC3, and TG3 (see figure 1-8) are mounted facing the left walls.

1. AIR INTAKE DUCT, TYPICAL IN TB1, TH1 AND TH2 SHELF TYPE TYPICAL IN TD2 AND TD3
2. AIR EXHAUST DUCT
3. SIGNAL CABLE DUCT, 4 X 6 WITH 4 X 4 VERTICAL DROP DOWN DUCT TYPICAL IN TB1, TH1 AND TH2, 4 X 12 WITH 4 X 6 VERTICAL DROP DOWN DUCT TYPICAL IN TD2 AND TD3
4. SIGNAL CABLE DUCT TYPICAL AS SHOWN IN TH1, 4 X 12
5. AC POWER CABLE DUCT, 4 X 4, WITH UTILITY OUTLET PER XMTR
6. CROSS CONTAINER CABLE DUCT
7. AIR CONDITIONER CONTROL
8. AC POWER BREAKER PANEL, 225 AMP, TYPICAL PER XMTR
9. UTILITY, AIR CONDITIONER AND CONTROL, LIGHTS POWER BREAKER PANEL
10. AC POWER ENTRY KICKPLATE
11. MODIFIED TMA-40K RF AMMETER
12. RF BALANCED TRANSMISSION LINE INSULATOR BOWL MOUNTING PANEL, AX-119 FEED THROUGH ASSEMBLY
13. RF UNBALANCED COAX LINE AND GAS BARRIER FEED THROUGH MOUNTING
14. AIR CONDITIONER VENTS TO DUCT AREA IN DROPPED CEILING
15. EXTERIOR EXHAUST HOOD
16. FIRE EXTINGUISHER, CO_2

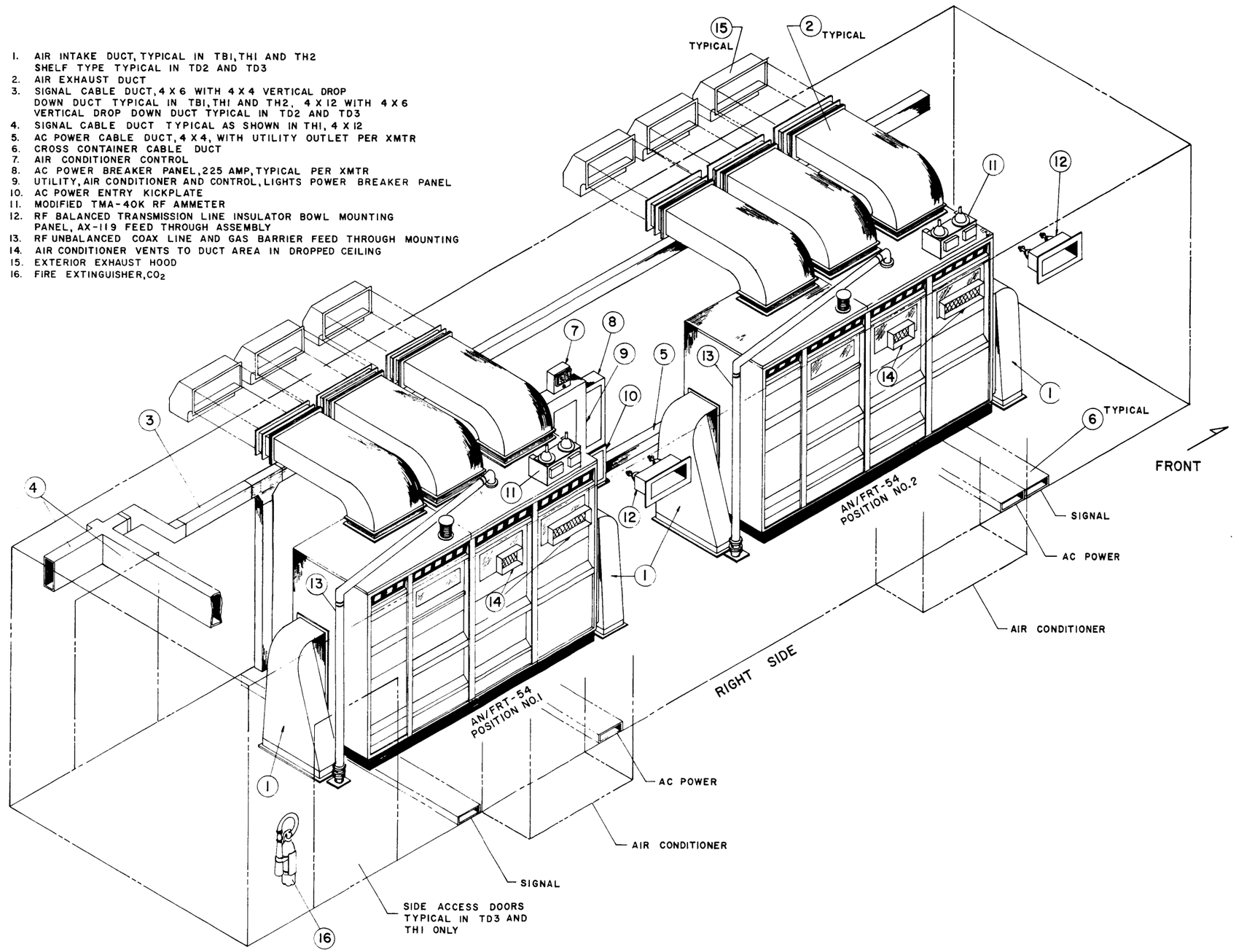


Figure 1-7. Radio Transmitting Set AN/TRT-18 (Typical of TB1, TD2, TD3, TH1, and TH2) Isometric View

1. AIR INTAKE DUCT
2. SIGNAL CABLE DUCT, 4 X 12 WITH 4 X 6 VERTICAL DROP DOWN TYPICAL AS SHOWN IN TC2 AND TC3. 4 X 6 WITH 4 X 4 DROP DOWN DUCT, NOT SHOWN, IN TG3
3. AIR EXHAUST DUCT
4. EXTERIOR EXHAUST HOOD
5. AC POWER CABLE DUCT, 4 X 4, WITH UTILITY OUTLET PER XMTR
6. CROSS CONTAINER CABLE DUCT
7. AIR CONDITIONER CONTROL
8. AC POWER BREAKER PANEL, 225 AMP, PER XMTR
9. AC POWER BREAKER PANEL FOR AIR CONDITIONER UNIT AND CONTROL, LIGHTS AND UTILITIES
10. AC POWER ENTRY KICKPLATE
11. MODIFIED TMA-40K RF AMMETER
12. RF BALANCED TRANSMISSION LINE INSULATOR BOWL MOUNTING PANEL, AX-119 FEED THROUGH ASSEMBLY
13. RF UNBALANCED COAX LINE AND GAS BARRIER FEED THROUGH MOUNTING
14. FIRE EXTINGUISHER, CO_2

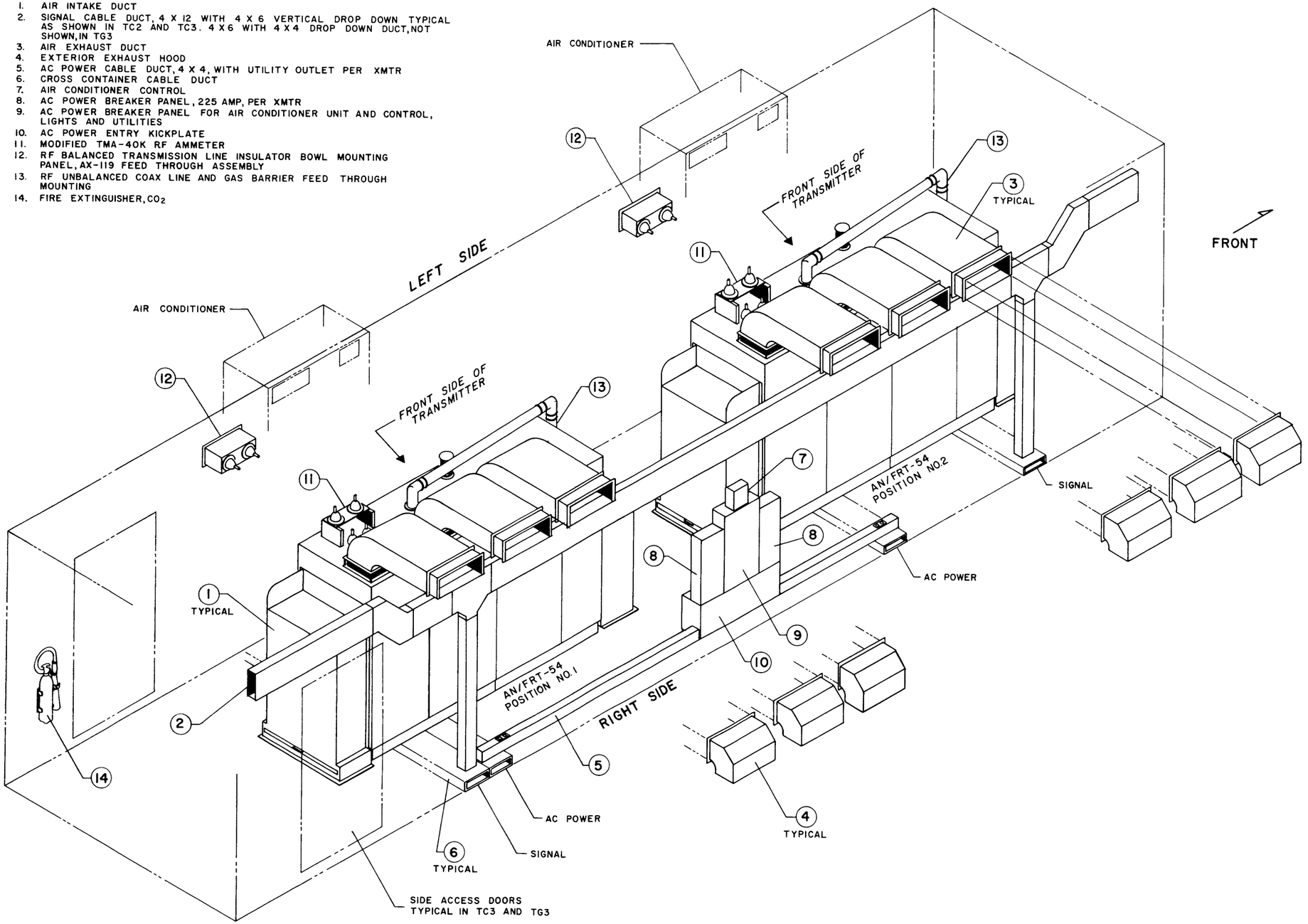


Figure 1-8. Radio Transmitting Set AN/TRT-18 (Typical of TC2, TC3, and TG3) Isometric View

1-37. MODEL AN/FRT-40B TRANSMITTER.

The AN/FRT-40B is a synthesized, 40-kilowatt (PEP) single-sideband transmitter that operates in the frequency range of 2 to 28 megacycles. Modes of operation include SSB, ISB, FSK, FAX, AM and CW. Frequency stability of the transmitter is one part in 10^8 per day. In emergencies or when low power output is desired, the intermediate power amplifier may be operated to provide a 10-kilowatt (PEP) output. For full power output, the transmitter requires a primary power input of 72 kilowatts. Input power to the transmitter is 3-phase, 208/230 volts AC at 50 to 60 cycles per second. Each AN/FRT-40B transmitter has provisions for both balanced and unbalanced output.

1-38. The AN/FRT-40B transmitter (see figure 1-9) consists of an exciter and a driver (IPA) in the two frames on the left, and a 40-kilowatt power amplifier and its power supply in two frames on the right. The exciter and driver are essentially an AN/FRT-39D transmitter that has been modified to drive the 40-kilowatt section. The high-power RF amplifier, main power control panel, and bias voltage supply are contained in the third frame, and the RF output circuits and high voltage power supply for the power amplifier are housed in the fourth or power supply frame. A modified TMA-40K RF ammeter, used to measure the RF current in each leg of the balanced transmission line, is installed on top of the power supply frame.

1-39. The standard hinged rear doors of the AN/FRT-40B transmitters have been removed and replaced with rear skins that are attached to the transmitter frames with quick-disconnect fasteners. Additional modifications to the AN/FRT-40B include all the modifications previously described for the AN/FRT-39D transmitter.

1-40. The AN/FRT-40B transmitters are installed down the center of the containers (see figures 1-7 and 1-8) providing maintenance access from both the front and the rear of the equipment. The mounting bases are secured with bolts to steel tapping plates installed in the container floors. The transmitter frames are connected to the container ground bus bar with 2-inch copper straps. Signal and AC power cables are brought into the transmitter bases through separate cross-container ducts which are located as illustrated.

1-41. The unbalanced RF output connection of the AN/FRT-40B transmitter is located on the top of the power amplifier (third) frame. A section of rigid 3 1/8-inch coaxial line is installed between the unbalanced RF output connector and a coaxial feed-through fitting and gas barrier installed in the container floor on the left side of the transmitter. The coaxial feed-through fitting connects with HJ8-50 3-inch flexible coaxiable cable under the container floor. The coaxial

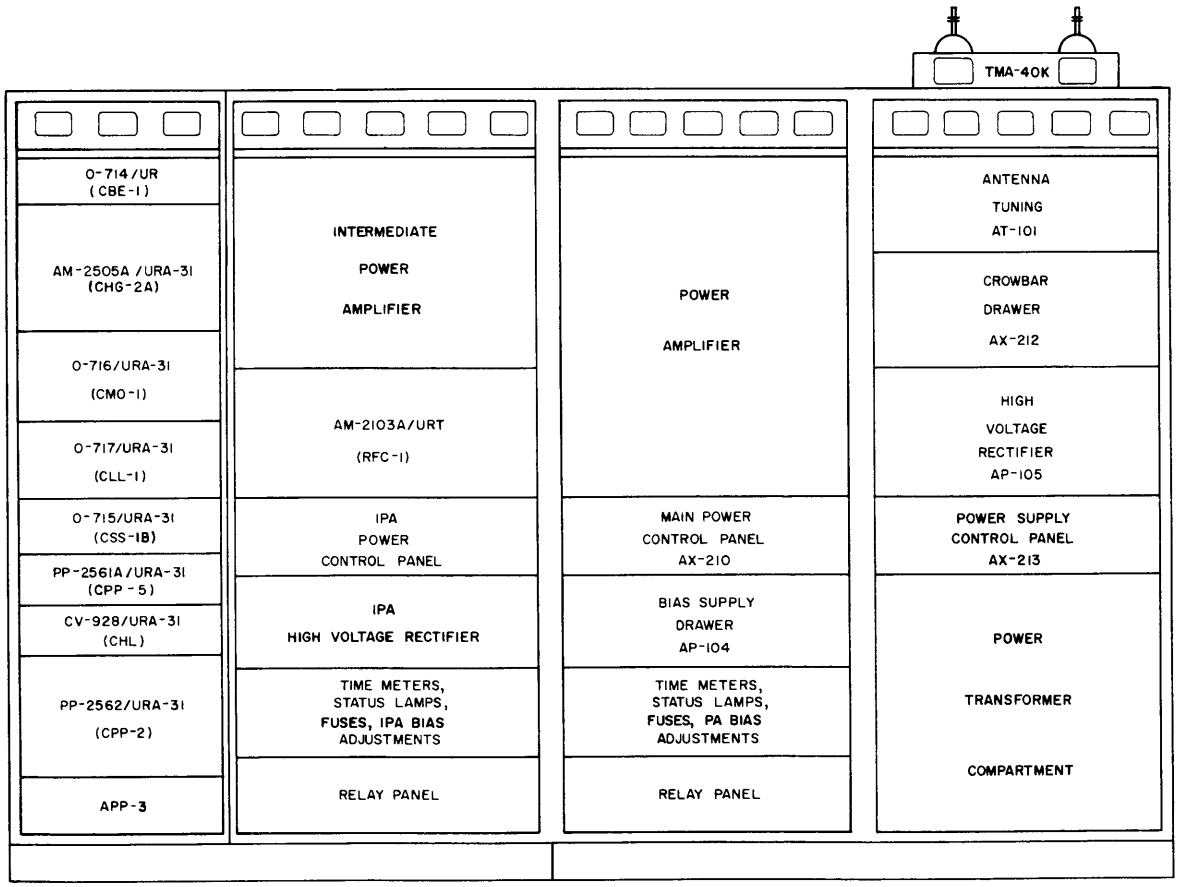


Figure 1-9. AN/FRT-40B Transmitter, Front Elevation

cable is terminated at an RF distribution panel in container TD1 or TG1. The HJ8-50 is an air-dielectric cable that is pressurized with dry air from a dehydrator unit in the RF distribution container.

1-42. The balanced RF output of the AN/FRT-40B is connected through 600-ohm balanced line from the modified TMA-40K RF ammeter on the power supply frame to an AX-119 feed-through assembly installed just below the ceiling on the outboard wall of the container. The panels are recessed into the container in the same manner as the feed through assemblies for the AN/FRT-39D transmitters.

1-43. VENTILATION DUCTS.

Intake ventilation ducts are provided at each end of the AN/FRT-40B transmitter. Air is brought into the ducts through cut-outs in the container floor and fed into ports on both sides of the transmitter. The intake ducts are equipped with re-usable dust filters that slip into the duct from the side a few inches above the floor.

1-44. The flared-type transmitter intake ventilation ducts illustrated in figure 1-7 are installed in containers TB1 and TH1. The shelf-type intake ventilation ducts illustrated in figure 1-8 are used in containers TC2, TC3, TD2, TD3 and TG3.

1-45. Three transmitter exhaust ventilation ducts are provided for each AN/FRT-40B transmitter. The ducts are installed between exhaust ports on the top of the driver, power-amplifier, and power supply frames and exhaust cut-outs on the upper inboard wall of the container. Screened exterior exhaust hoods are installed over the exhaust cut-outs on the outside of the container to keep rain and foreign material out of the transmitters. The exhaust ventilation ducts are cushioned at both ends with short bellows sections.

1-46. SIGNAL DUCT AND CABLE INSTALLATION.

Inter-container signal cable duct in all AN/TRT-18 containers is mounted just below the transmitter exhaust ventilation ducts on the wall behind the transmitters. 4 x 6 signal duct with two 4 x 4 vertical drop-down sections is installed in containers TB1, TH1 and TG3, and 4 x 12 signal duct with two 4 x 6 vertical drop-down sections is provided in containers TC2, TC3, TD2 and TD3. The vertical drop-down sections connect the inter-container signal duct with cross-container signal duct installed under the container floors. One cross-container cable duct, which feeds cables directly into the transmitter base, is provided for each AN/FRT-40B.

1-47. In container TH1, a special duct network is installed at the rear of the container (see figure 1-7). A transverse 4 x 12 duct section is mounted against the ceiling crossing the container above the side doors. On the left wall, a transition section raises the 4 x 6 wall-mounted duct connecting into a 4-way transition piece that connects with 4 x 12 signal duct in container TG1 through the left wall, a 4 x 12 signal duct into TC1 through the rear, and the transverse 4 x 12 duct section that extends through the right wall into container TA1. The 4 x 12 inter-container duct is raised to ceiling level by means of transition sections at both ends of the container in TC2, TC3, TD2 and TD3.

1-48. Each AN/FRT-40B transmitter is provided with a 4-pair shielded signal cable that terminates on the MDF's in transmitter control container TC1, and RG-58/U coaxial cable to the RF monitor patch panel in TC1, and a 4-wire external interlock and radiation indicator cable to an RF distribution patch panel. The cables are fed into the cross-container signal duct from the transmitter bases, then through the vertical drop-down sections into the inter-container duct where they are terminated in a connector near the rear of the container. A mating connector on the end of the inter-container cable joins each external cable with the associated transmitter cable after the container is positioned at the site. BNC connectors are used for the RG-58/U coaxial cable, and type MS-3101A connectors are used for the 4-pair and 4-wire cables.

1-49. AN/TRT-18 POWER CABLING.

Three power distribution panels are provided in each AN/TRT-18 container. The power panels are mounted on the inboard wall in approximately the middle of the container. One 225-ampere power panel is provided for each AN/FRT-40B transmitter, and the third 225-ampere panel houses circuit breakers for the air conditioning units, the air-conditioner control unit, lighting and utility outlets. Three stuffing tubes and a power terminal board are located in the kickplate area below the power distribution panels. Three 4-conductor 4/0 power feeders from the power distribution container GT1 are brought into the container through the stuffing tubes and then connected to the power terminal board. Each power feeder then connects into one power distribution panel from the terminal board.

1-50. All power wiring, except the lighting circuits, is run in the 4 x 4 AC duct which extends from each side of the power kickplate. The transmitter and air conditioner power wiring is fed into the AC cross-container ducts from the 4 x 4 duct. The transmitter power wiring feeds directly into the transmitter bases from the cross-container ducts, and the air conditioner power and control wiring is terminated in a receptacle mounted on the cross-container duct on the opposite side of the container. One air-conditioner control unit, which controls both air conditioning units, is mounted on the center power distribution panel.

1-51. RADIO TRANSMITTING SET AN/TRT-20.

Radio Transmitting Set AN/TRT-20, container TH2, originally housed one AN/FRT-40B transmitter with provisions for the installation of a second AN/FRT-40B transmitter. Subsequently, the second transmitter was installed and Transmitting Set AN/TRT-20 is now identical to container TH1, an AN/TRT-18 Radio Transmitting Set, except for the special signal ductwork installed at the rear of container TH1.

1-52. RADIO TRANSMITTING SET AN/TRT-23.

Radio Transmitting Set AN/TRT-23, container TA3 (see figures 1-10 and 1-11) houses two model AN/FRT-

1. EXTERIOR EXHAUST HOOD
2. AIR EXHAUST DUCT
3. SIGNAL CABLE DUCT, 4 X 6
4. SIGNAL JUNCTION BOX
5. SIGNAL CABLE DUCT, 4 X 4
6. AIR CONDITIONER CONTROL
7. AC POWER BREAKER PANELS
8. AC POWER ENTRY KICKPLATE
9. AIR INTAKE DUCT
10. CROSS CONTAINER CABLE DUCT
11. ANTENNA FEED THRU ENTRY BOX
12. MODIFIED TMA-10K
13. RF BALANCED OUTPUT TRANSMISSION LINE, INSULATOR BOWL MOUNTING PANEL

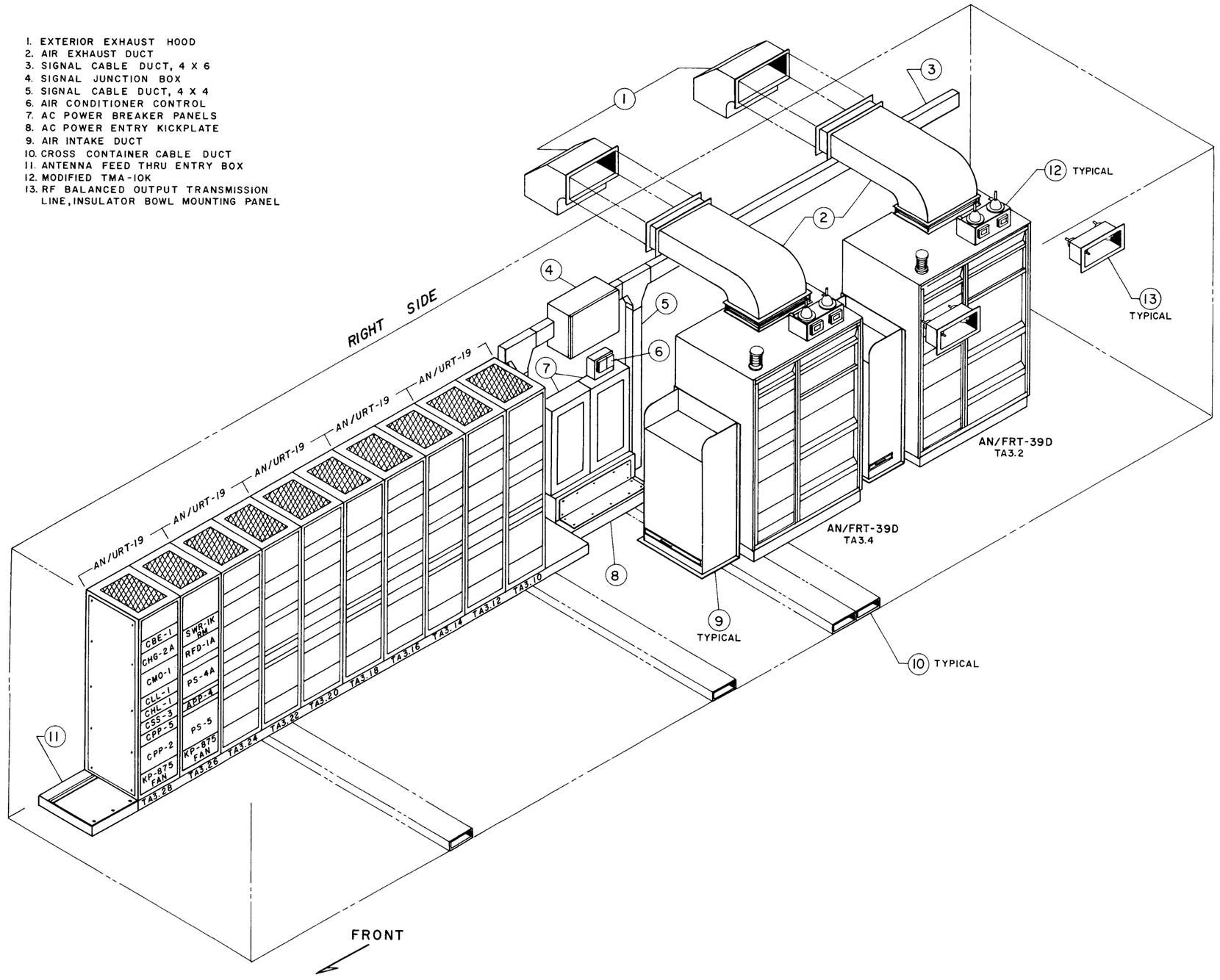


Figure 1-10. Radio Transmitting Set AN/TRT-23 (Container TA3, Right Side) Isometric View

1. RF BALANCED OUTPUT TRANSMISSION LINE, INSULATOR BOWL MOUNTING PANEL
2. MODIFIED TMA-10K
3. TRC-3500 BALUM
4. ANTENNA FEED THRU ENTRY BOX
5. CROSS CONTAINER CABLE DUCT
6. EXTERIOR EXHAUST HOOD
7. AIR EXHAUST DUCT
8. AIR INTAKE DUCT
9. SIGNAL CABLE DUCT, 4 X 6
10. SIGNAL CABLE DUCT, 4 X 4
11. SIGNAL AND AC POWER BASE ENTRY CABLE DUCT, 4 X 4
12. RIGID COAX, 1 5/8, AND FITTINGS
13. HELIAX GAS BARRIER FEED THRU FITTING
14. FIRE EXTINGUISHER, CO_2

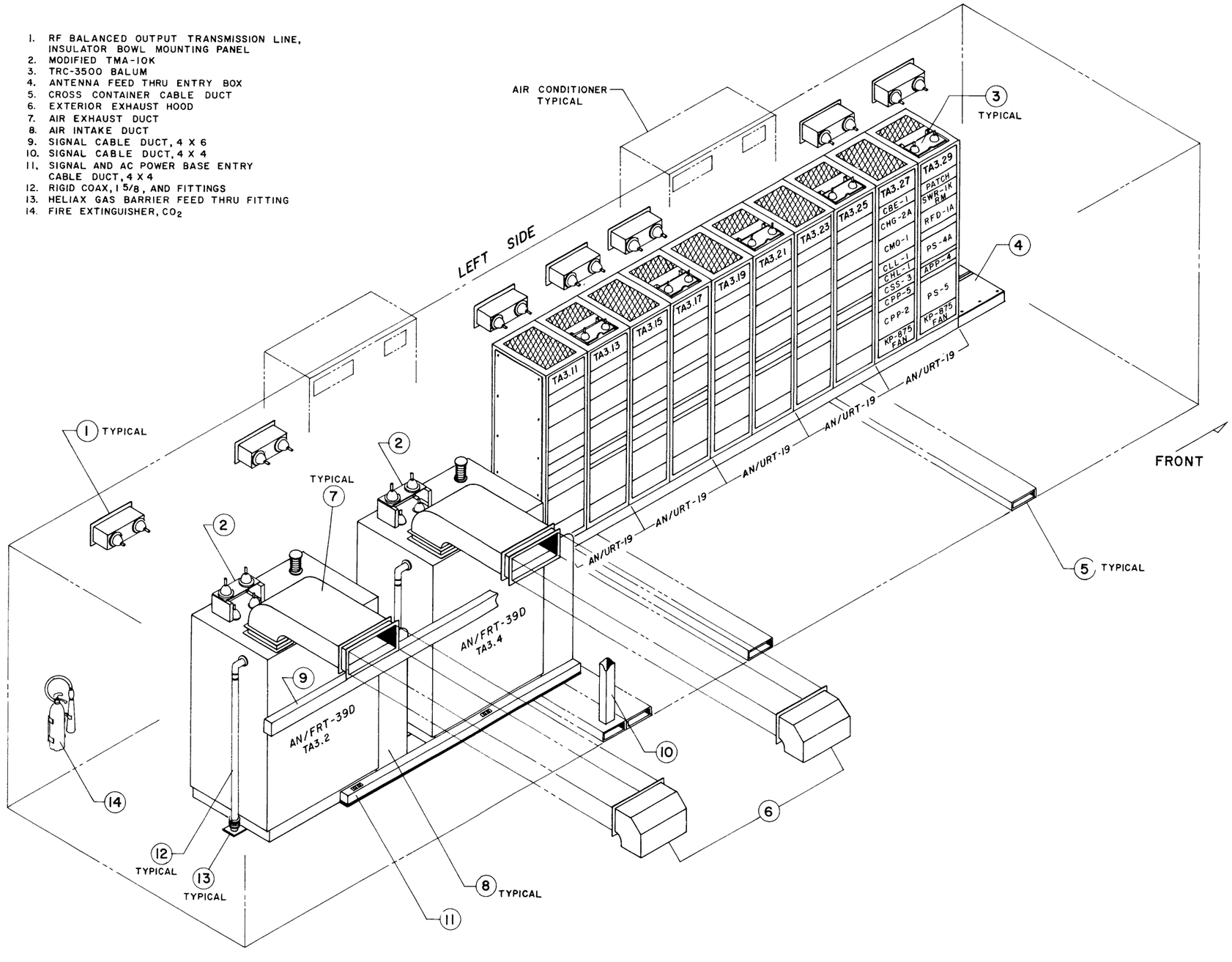


Figure 1-11. Radio Transmitting Set AN/TRT-23 (Container TA3, Left Side) Isometric View

39D transmitters and ten model AN/URT-19(V) transmitters. The AN/FRT-39D transmitters are installed in the center of the rear half of the container providing maintenance access from both the front and the rear of the equipment. These transmitters are identical to the AN/FRT-39D units previously described. The AN/URT-19(V) transmitters are installed in the forward half of the container, five against each sidewall. All parts of the AN/URT-19(V) transmitters are accessible from the front for maintenance.

1-53. The AN/TRT-23 container, TA3, is at the end of wing A of the complex (figure 1-1) and is equipped with a removable end wall at the front. Two air conditioning units are mounted on the left outside wall which faces outboard in the complex. A CO_2 fire extinguisher supported on a wall mounted bracket is installed on the left rear wall. A 24-hour clock is provided for this container. AN/TRT-23 is a type 2 container with no side doors.

1-54. MODEL AN/URT-19(V) TRANSMITTER.

The AN/URT-19(V) is a synthesized, 1-kilowatt (PEP) single-sideband transmitter that operates in the frequency range of 2 to 28 megacycles. Frequency stability of the AN/URT-19(V) is one part in 10^8 per day. Modes of operation include SSB, ISB, FSK, FAX, AM and CW. Power input requirement for the transmitter is approximately two kilowatts. Input power is 115 volts AC, 50/60-cps, single phase. Five of the AN/URT-19(V) transmitters installed in container TA3 have provisions for both balanced and unbalanced operation, (see figure 1-12) and five are equipped for unbalanced output only (see figure 1-13). The left frame of each AN/URT-19(V) transmitter houses the components of a Modulator-Oscillator Group AN/URA-30A exciter and the right frame contains the components of a 1-kilowatt power amplifier.

1-55. The AN/URT-19(V) transmitters have been removed from their original equipment cabinets and the components of each transmitter are installed in two standard AN/TSC-35 equipment racks. The door mounted ventilating fan assemblies of the original cabinets are not used since the transmitters are mounted flush against the side-walls of the container. Instead, a KP-875-2 ventilating fan assembly is installed in the bottom position of each transmitter rack to provide cooling air for the rack mounted components. The air is exhausted into the container interior through a screened panel at the top of each transmitter equipment rack. Since the original rear doors were equipped with interlocks, the door interlock circuits of the transmitter harness are shorted to complete the interlock circuit. This and other electrical modifications

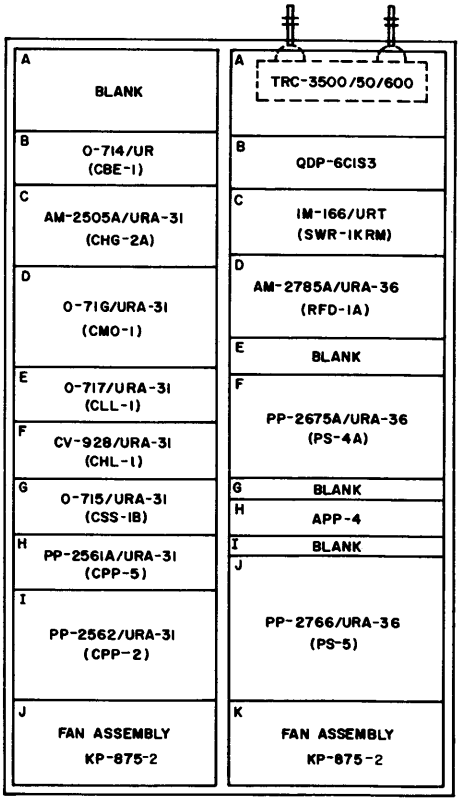


Figure 1-12. AN/URT-19(V) Transmitter, Balanced/Unbalanced Output, Front Elevation

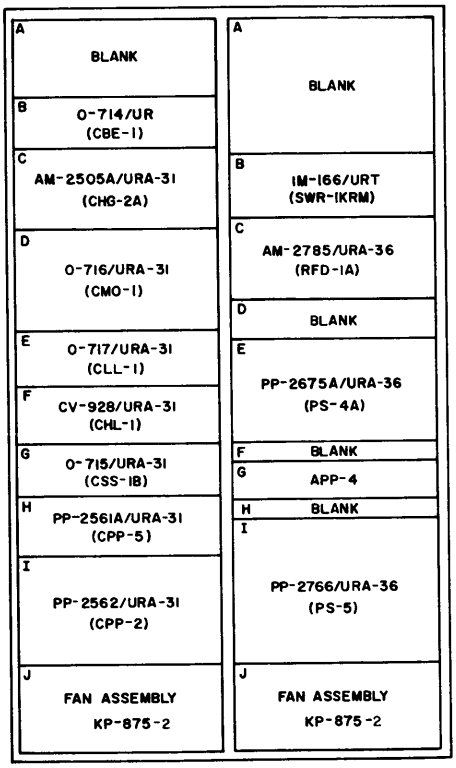


Figure 1-13. AN/URT-19(V) Transmitter, Unbalanced Output Only, Front Elevation

to the AN/URT-19(V) transmitters are described in section 3 of this volume. Other mechanical modifications are described in the following paragraphs.

1-56. The TH-39A/UGT (TIS-3) units, normally mounted in position H of the exciter frame (see figures 1-12 and 1-13) have been relocated in container TC1, and the PP-2561A/URA-31 (CPP-5) power supply which is normally mounted at the rear of the exciter frame has been moved to the front of the exciter frame in position H. The AM/2505A/URA-31 (CHG-2A) units in the exciter frame have been modified to include relays in the B+ lines to provide remote push-to-talk keying capability for voice operation. A 12-volt step-down transformer added to the power amplifier frame provides remote radiation indication signals to containers TC1 and an RF distribution container (TD1 or TG1) when high voltage is applied to the transmitter.

1-57. The AN/URT-19(V) transmitter interlock circuits are extended to associated RF patch panels in an RF distribution container. The transmitter RF monitor circuit on the CHG-2A frequency amplifier panel is extended to the RF monitor patch panel in container TC1. Utility outlets on the APP-4 auxiliary power panel are powered from separate circuit breakers in the container power distribution panel.

1-58. A TRC-3500/50/600 antenna coupler (balun) and a QDP-6C1S3 RF patch panel are installed in the top of the power amplifier rack of the balanced/ unbalanced type AN/URT-19(V) transmitters. The balun matches the unbalanced RF output of the transmitter with a 600-ohm balanced line. In this type of AN/URT-19(V) transmitter, the RF output of the power amplifier, the input to the balun, and a coaxial cable to an RF distribution container are terminated in coaxial connectors on the QDP-6C1S3 RF patch panel. The transmitter RF output may be patched to either the balun for balanced operation or to the RF distribution container for unbalanced operation. Each connector on the RF patch panel is equipped with an interlock switch that is connected in series with the transmitter interlock circuit, requiring a complete patch on the patch panel before the transmitter can be energized.

1-59. The AN/FRT-39D transmitters are installed on their own mounting bases which are secured to tapping plates installed in the container floor. Signal and power wiring to the transmitters is routed through two cross-container ducts near the center of the container into a 4 x 4 duct mounted against the rear of the transmitter bases and into the bases to service the transmitters. One intake ventilation duct is provided on the left side of each transmitter. Air is brought in through a cut-out in the container floor and directed into an intake port in the side of the auxiliary frame of the AN/FRT-39D. The air exhaust port of the transmitter is located on the top of the main frame. The transmitter exhaust ventilation duct carries the air from this port to a cut-out in the upper right wall of the container. Screened exterior exhaust hoods are mounted over the cut-outs on the outside of the container.

1-60. The balanced and unbalanced RF output connections of the AN/FRT-39D transmitters are identical to those of the AN/FRT-39D transmitters previously described. The balanced output feed-through assemblies are mounted in the left wall opposite the front of the transmitters. The container ground bus bar is installed down the center of the container under the AN/FRT-39D transmitters, then branches to both sides extending forward under the AN/URT-19(V) transmitters. The frames of all transmitters are grounded to this bus bar using 2-inch copper straps.

1-61. The AN/URT-19(V) transmitters are mounted on standard AN/TSC-35 rack base duct. The balanced/ unbalanced types are mounted on the left side of the container and the unbalanced types on the right side (see figures 1-10 and 1-11). The rack base ducts are secured with bolts to tapping plates under the front and rear base members, and the top angle members of the transmitter racks are secured to tapping plates in the container walls.

1-62. An antenna feed-thru entry box is installed at the end of each base duct at the front of the container. RG-8A/U coaxial cables are connected from the unbalanced RF output connectors of the AN/URT-19(V) transmitters to feed-through coaxial connectors in the antenna feed-through entry boxes. FHJ-5 foam-dielectric coaxial cables are used between the feed-through connectors and the RF distribution patch panels.

1-63. The balanced RF outputs of the AN/URT-19(V) transmitters on the left side of the container connect from the baluns at the tops of the power amplifier frames to balanced feed-through assemblies installed in the left wall behind the transmitters.

1-64. AN/TRT-23 SIGNAL DUCT AND CABLE INSTALLATION.

Inter-container cables installed for each AN/FRT-39D and each AN/URT-19(V) transmitter in this container include a 4-pair shielded signal cable, a 4-wire external interlock and radiation indicator cable, and an RG-58/U coaxial cable. All of these cables are terminated on connectors in a signal junction box mounted on the right wall near the center of the container (see figure 1-10). The cables from container TC1 and RF distribution area are brought into container TA3 through the 4 x 6 wall mounted duct on the right wall, terminated with mating connectors and joined with the container cables in the signal junction box. Cables to the AN/FRT-39D transmitters are run out of the right side of the signal junction box, down the vertical 4 x 4 duct, into the cross-container duct, and into the 4 x 4 floor-mounted duct behind the transmitters. Cables to the AN/URT-19(V) transmitters are run out of the left side of the signal junction box, and down a vertical duct section to the rack base duct. The cables for the left side 1-kilowatt transmitters are then run into cross-container cable ducts and into the left-side rack base duct.

1-65. AN/TRT-23 POWER CABLING.

Primary AC power is brought into container TA3 over two 4-conductor 4/0 cables from the power distribution container GT1. The cables enter through two

stuffing tubes in the AC power entry kickplate on the right side of the container. One cable feeds each of the power distribution panels above the kickplate. Circuit breakers for the transmitters, air conditioning units, air conditioner control unit, lighting and utility circuits are distributed between the two panels. The AN/FRT-39D power cables from the circuit breakers are run into the cross-container duct directly below the power kickplate, and the power cables for the AN/URT-19(V) transmitters are fed into the end of the rack base duct from the kickplate. The cables for the left side AN/URT-19(V) equipment are run from the rack base duct into the cross-container cable ducts in the forward area of the container. One air-conditioner control unit which controls both air conditioning units is mounted on the right power distribution panel.

1-66. RADIO TRANSMITTING SET AN/TRT-24.

Radio Transmitting Set AN/TRT-24, container TH3, (see figure 1-14) houses a high-power, high-frequency AN/FRT-62 transmitter, a TER-100K dummy load, a control unit for the associated transmitting antenna, and a dehydrator unit. The container is equipped with two side doors at the rear. The left side door leads to a side-to-side walkway into container TG3, and the right door leads to the outside. Two air conditioning units are mounted on the outside of the right wall. Primary power distribution panels are mounted on the left forward wall, and a CO_2 fire extinguisher supported on a wall-mounted bracket is installed on the right rear wall.

1-67. The AN/FRT-62 transmitter consists of a 40-kw driver section and a 200-kw power amplifier section. The 40-kw section is essentially an AN/FRT-40B transmitter which has been modified to drive the 200-kw section. The driver is housed in four frames and the power amplifier is housed in five frames that include a buffer frame, a power-amplifier tube compartment, the final power amplifier frame and two power supply frames. The transmitter is mounted on bases except for the buffer frame which is mounted directly on the floor. Adjoining frames are bolted together and the transmitter is secured to tapping plates installed lengthwise in the container floor along the front and rear of the transmitter. The transmitter is installed in the center of the container providing access to both front and rear for maintenance. The TER-100K dummy load for the power amplifier is mounted at the front end of the container in line with the transmitter. A 25-kilowatt (average power) dummy load for the 40-kw section is housed inside the buffer frame.

1-68. Transmitter intake ventilation ducts are installed at each end, and a third air intake is provided in the buffer frame os the AN/FRT-62 transmitter. Air is brought in through cut-outs in the container floor. Dust filters that slip in from the front are provided for the duct at each end of the transmitter. The air intake under the buffer frame is equipped with two dust filters that are mounted in frames installed underneath the container.

1-69. Transmitter exhaust ventilation ducts are provided for the driver, PA tube compartment, final power amplifier and the two power supply frames. Air from the PA tube compartment is exhausted through the roof of the container. This duct is equipped with an all-weather screened hood which is mounted on the roof. The remaining four ducts exhaust air through cutouts in the upper left wall of the container and are protected with screened exhaust hoods bolted to flanges on the outside wall of the container.

1-70. The AN/FRT-62 is a synthesized 200-kilowatt (PEP) transmitter that provides SSB, ISB, AM, CW, FSK and FAX modes or operation in the frequency range of 2 to 28 megacycles. Primary power input for full power output is 362 kilowatts. The transmitter may be operated at full power output from the power amplifier section, or at reduced power output (40-kilowatts PEP) from the driver section. Both transmitter sections have provisions for balanced and unbalanced output. The 200-kw power amplifier may also be driven by a remote AN/FRT-40B transmitter from another container. A coaxial switching system and coaxial line are installed for this purpose.

1-71. The unbalanced output of the driver section is connected to a coaxial TEE switch on top of the driver. One output of the TEE connects through rigid 3-1/8-inch coax to another TEE switch on top of the buffer frame, and the other output connects through rigid coax to a feed-through coaxial fitting in the floor behind the driver. This coax run is extended through 3-inch flexible coaxial cable to an antenna patch panel where it may be patched to an antenna. The TEE switch on the buffer frame is connected through another section of rigid coax to a feed-through fitting in the floor behind the buffer frame. This coax may be extended directly to an AN/FRT-40B transmitter in another container or to an antenna patch panel where it may be patched to a transmitter. The second output of the TEE on the buffer frame feeds into a coaxial switch inside the buffer frame where the RF output of the driver may be switched to the input of the power amplifier or to the 40-kw dummy load. Remote-local driver switching is controlled from a driver control unit that is mounted on top of the buffer frame (item 14 in figure 14).

1-72. The unbalanced output of the 200-kw section is fed through 6 1/8-inch rigid coax to a TEE located between the transmitter and the high-power dummy load. Coaxial switches at the output of the TEE direct the RF output to the dummy load during tuning, or to an antenna through a feed-through coaxial fitting installed in the floor. The switches are controlled from the power supply A frame. Coaxial fittings provided under the container floor include a gas barrier and a 90-degree elbow which connects to 6-inch flexible coaxial feed-line to the antenna.

1-73. The balanced RF output of the 200-kw section connects from the top of the power supply B frame through a short section of 600-ohm balanced line to a feed-through assembly mounted on the roof of the container. This balanced line is enclosed in a RF shield to reduce RF radiation inside the container. The balanced RF output of the 40-kw section is connected through a section of 600-ohm line from the top of the 40-kw power supply frame to a feed-through assembly installed in the upper right wall of the container.

1-74. The radiation indicator and external-interlock circuits of the 40-kw section of the transmitter are extended to an antenna patch panel, and the RF monitor circuit is extended to the transmitter control container TC1. The AM-2505 (CHG-2) unit has been modified for push-to-talk keying by the addition of a relay in the B+ line. The TH-39A/UGT (TIS) unit has been relocated in container TC1.

1-75. The AN/FRT-62 transmitter is provided with a 1000-ampere circuit breaker for the power amplifier section and a separate 225-ampere circuit breaker for the 40-kw section. A third power distribution panel houses circuit breakers for the air conditioning units, the air-conditioner control unit, lighting, utility outlets, antenna control unit, dehydrator, driver control unit and the dummy load. A control unit for both air conditioners is mounted on the top of this power distribution panel.

1-76. 4 x 6 signal duct is installed along the left wall of container TH3 as shown. A small signal junction box (item 15 in figure 14) is provided for terminating the interlock and ready circuits of a remote 40-kw driver. A 4-pair shielded cable is provided for the transmitter signal and push-to-talk circuits. The signal cable, a 4-wire radiation indicator and external interlock cable, and the RF monitor coaxial cable are terminated in connectors inside the signal duct at the rear of the container. These cables are then extended to container TC1 and the antenna patch panel when the container is installed on site.

1-77. AC power duct is installed on the floor along the left wall as shown, and 1700 raceway equipped with utility outlets is installed along both walls of the container. The raceway along the right wall services the dehydrator and the antenna control unit. The air conditioner power and control wiring is terminated in receptacles that are installed in cross-container duct adjacent to the air conditioner units.

1-78. RADIO TRANSMITTING SET AN/TRT-25.

Radio Transmitting Set AN/TRT-25 consists of containers TH4 and TG4 (see figures 1-15 and 1-16) which house an AN/FRT-61 low-frequency transmitter. Container TH4 houses all components of the transmitter except the low pass filter and the centrifugal fan assembly which are installed in container TG4. The AN/FRT-61 operates in the frequency range of 50 to 150 kilocycles providing a maximum power output of 50 kilowatts, average power.

1-79. Both containers, TH4 and TG4, are equipped with side doors at the rear, and a side-to-side walkway is installed between them. The side door into TG4 from the walkway is equipped with a key interlock which is part of the AN/FRT-61 safety interlock system. The left side door of TG4 is an emergency exit and can only be opened from the inside. Container TG4 is divided into two areas by a partition near the rear of the container. The partition has a key interlock door that leads into the low pass filter compartment from the smaller area used for storage. Both containers are at the ends of their respective wings and have removable end walls installed at the front. A door is provided in the end wall of each container. Container TH4 is equipped with three air conditioning units that are mounted on the outside right wall, and TG4 has one unit mounted on the outside left wall.

1-80. The components of the AN/FRT-61 transmitter housed in container TH4 are installed down the center of the container as shown in figure 1-15, providing access from the front and rear for maintenance. All components are mounted on their bases which are bolted to steel tapping plates in the container floor. A transmitter intake ventilation duct is provided for the RF power amplifier AM-3351/FRT-61. The duct is installed on the floor at the rear of the transmitter extending from a cut-out in the left wall to an air intake port near the bottom of the power amplifier frame. Air is furnished to this duct from the centrifugal fan assembly in container TG4 through a section of duct installed between the two containers. An intake ventilation duct for the AM-3350 driver section is installed on the left side of the driver over an air intake cutout in the floor of the container. Air from the power amplifier is exhausted through the roof of the container. This duct is protected by a screened all-weather hood which is mounted on the roof. The exhaust ventilation duct for the driver section is installed from the top of the unit to a cut-out in the upper left wall of the container.

1-81. The main power breaker on the left side-wall at the front houses a circuit breaker for the AN/FRT-61 transmitter. A power transformer that is mounted beside the main power breaker raises the input line voltage from 208 volts to the 230 volts required by the AN/FRT-61. An auxiliary power breaker panel that is mounted to the rear of the power transformer houses circuit breakers for the air conditioning units, the air-conditioner control unit, lighting, and utility outlets. A control unit for all three air conditioning units is installed on the top of the auxiliary power breaker panel. AC utility outlets are mounted on raceway that is installed on both walls of the container. A CO_2 fire extinguisher is provided at each end of the right side wall.

1-82. The RF output of the transmitter connects from balanced output terminals at the top of the C-4160 amplifier control unit to a feed-through assembly in the upper left wall of TH4. The RF output then connects from the feed-through assembly to the low pass filter in container TG4. 4 x 6 cable duct with a 4 x 4 vertical drop-down section that connects with cross-container duct under the floor is mounted on the left wall. A 4-pair signal cable, a 4-wire radiation indicator circuit cable, and an RF monitor coaxial cable are extended to the transmitter control container TC1 from the AN/FRT-61 transmitter.

1-83. The low-pass filter is centered in container TG4 (see figure 1-16) providing access from all sides for maintenance. The balanced RF output from the AN/FRT-61 transmitter enters through a feed-through

1. AC POWER ENTRY KICKPLATE
2. AC POWER BREAKER PANEL, 1000 AMP, 200KW XMTR
3. AC POWER BREAKER PANEL, 225 AMP, 40KW XMTR
4. AC POWER BREAKER PANEL, 225 AMP, AIR CONDITIONER AND CONTROL, LIGHTS, UTILITIES, ANTENNA CONTROL, DEHYDRATOR, DUMMY LOAD AND DRIVER CONTROL UNIT
5. AIR CONDITIONER CONTROL
6. RF BALANCED TRANSMISSION LINE FEED THRU, 200KW XMTR
7. RADIATION SHIELD
8. RF UNBALANCED COAX LINE AND GAS BARRIER FEED THRU, 200KW XMTR
9. COAX RELAY SWITCHES, 200KW XMTR
10. RF BALANCED TRANSMISSION LINE FEED THRU, AX-119 ASSEMBLY, 40KW XMTR
11. RF UNBALANCED COAX LINE AND GAS BARRIER FEED THRU, 40KW XMTR
12. COAX RELAY SWITCHES, 40KW XMTR
13. RF AMMETER
14. DRIVER CONTROL UNIT
15. JUNCTION BOX
16. DEHYDRATOR
17. ANTENNA CONTROL UNIT
18. TER-100K DUMMY LOAD, RF POWER DISSIPATOR
19. EXCITER FRAME, 10KW
20. POWER AMPLIFIER FRAME, 10KW
21. POWER AMPLIFIER FRAME, 40KW
22. POWER SUPPLY FRAME, 40KW
23. AIR INTAKE AND BUFFER FRAME
24. POWER AMPLIFIER TUBE COMPARTMENT, 200KW
25. POWER AMPLIFIER FRAME, 200KW
26. POWER SUPPLY "A", 200KW
27. POWER SUPPLY "B", 200KW

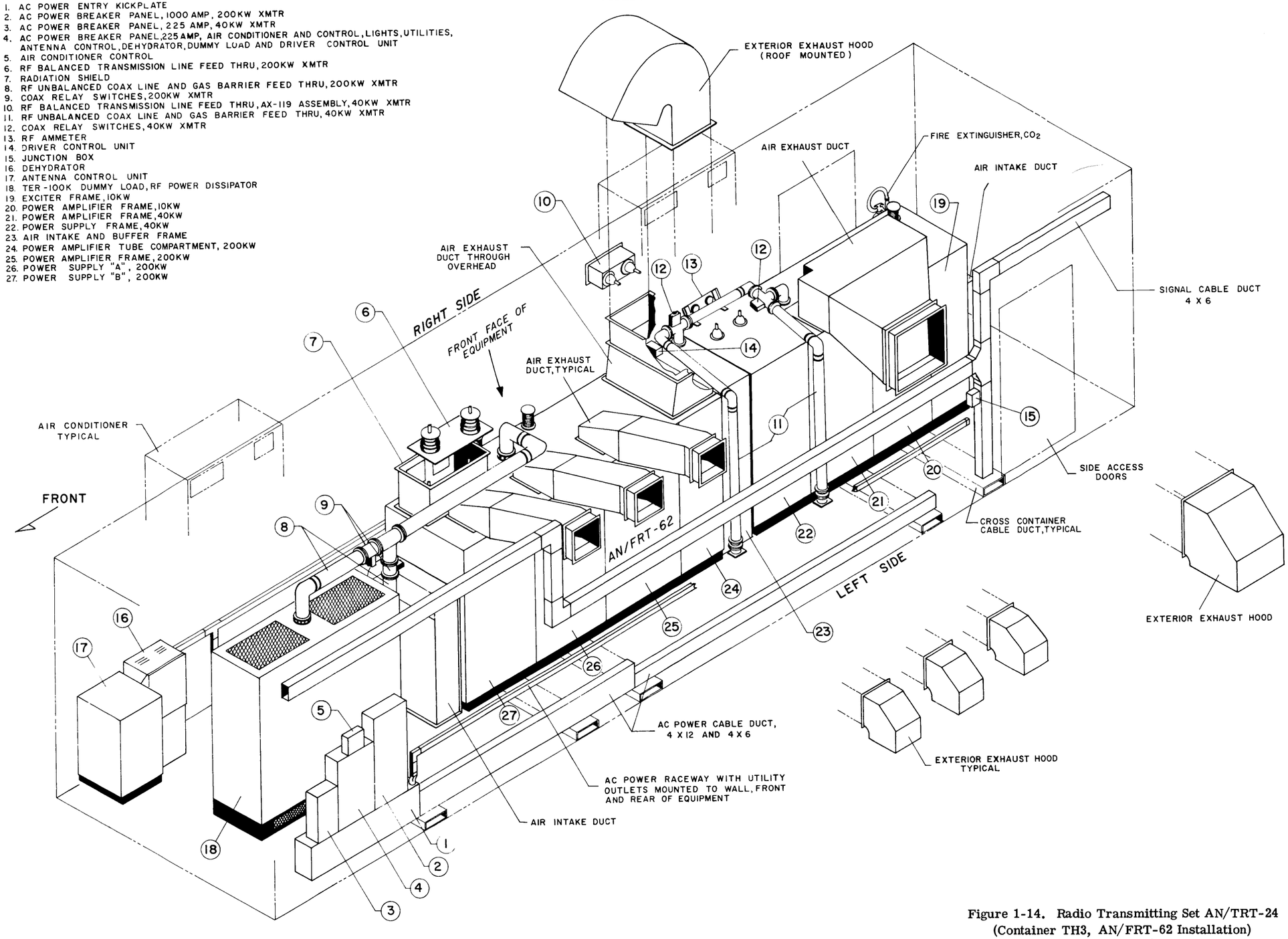
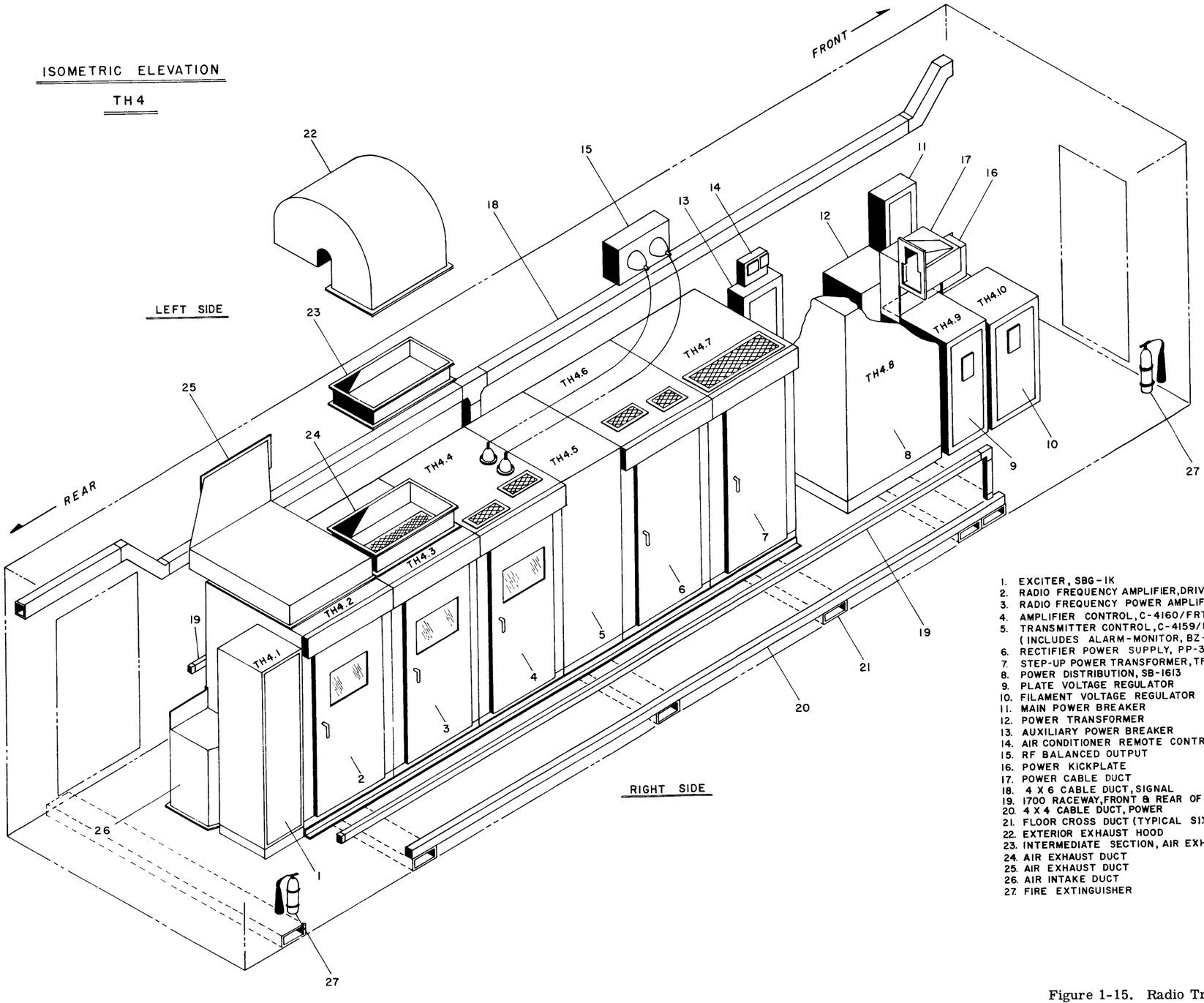


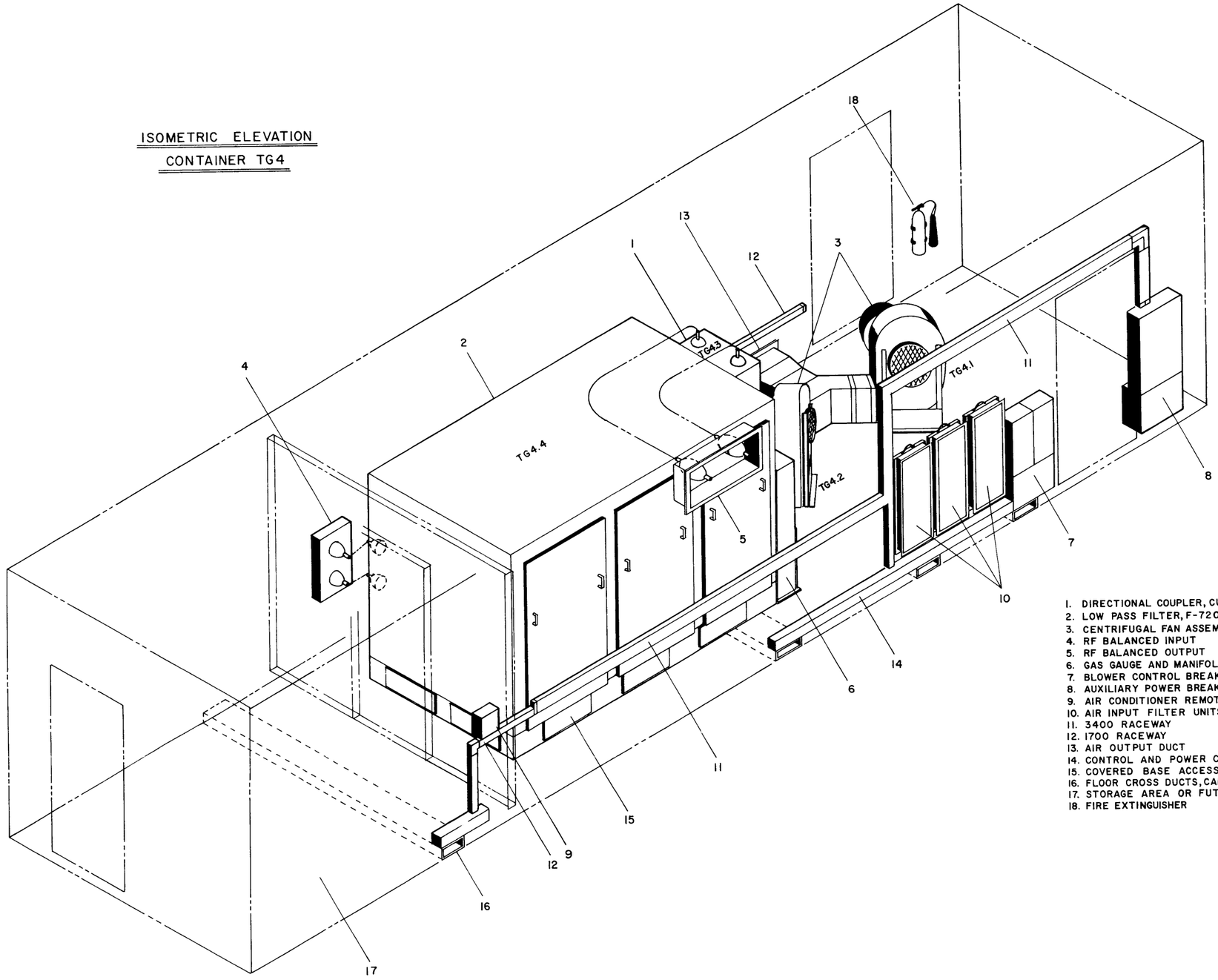
Figure 1-14. Radio Transmitting Set AN/TRT-24 (Container TH3, AN/FRT-62 Installation) Isometric View



1. EXCITER, SBG-1K
2. RADIO FREQUENCY AMPLIFIER, DRIVER, AM-3350/FRT-61
3. RADIO FREQUENCY POWER AMPLIFIER, AM-3351/FRT-61
4. AMPLIFIER CONTROL, C-4160/FRT-61
5. TRANSMITTER CONTROL, C-4159/FRT-61
   (INCLUDES ALARM-MONITOR, BZ-75/FRT-61)
6. RECTIFIER POWER SUPPLY, PP-3403/FRT-61
7. STEP-UP POWER TRANSFORMER, TF-401/FRT-61
8. POWER DISTRIBUTION, SB-1613
9. PLATE VOLTAGE REGULATOR
10. FILAMENT VOLTAGE REGULATOR
11. MAIN POWER BREAKER
12. POWER TRANSFORMER
13. AUXILIARY POWER BREAKER
14. AIR CONDITIONER REMOTE CONTROL
15. RF BALANCED OUTPUT
16. POWER KICKPLATE
17. POWER CABLE DUCT
18. 4 X 6 CABLE DUCT, SIGNAL
19. 1700 RACEWAY, FRONT & REAR OF EQUIPMENT (DUPLEX RECEPTACLES)
20. 4 X 4 CABLE DUCT, POWER
21. FLOOR CROSS DUCT (TYPICAL SIX PLACES)
22. EXTERIOR EXHAUST HOOD
23. INTERMEDIATE SECTION, AIR EXHAUST
24. AIR EXHAUST DUCT
25. AIR EXHAUST DUCT
26. AIR INTAKE DUCT
27. FIRE EXTINGUISHER

Figure 1-15. Radio Transmitting Set AN/TRT-25 (Container TH4, AN/FRT-61 Installation) Isometric View

ISOMETRIC ELEVATION
CONTAINER TG4



1. DIRECTIONAL COUPLER, CU-1065/FRT-61
2. LOW PASS FILTER, F-720/FRT-61
3. CENTRIFUGAL FAN ASSEMBLY, HD-554/FRT-61
4. RF BALANCED INPUT
5. RF BALANCED OUTPUT
6. GAS GAUGE AND MANIFOLD KICKPLATE
7. BLOWER CONTROL BREAKERS AND KICKPLATE
8. AUXILIARY POWER BREAKER AND KICKPLATE
9. AIR CONDITIONER REMOTE CONTROL UNIT
10. AIR INPUT FILTER UNITS
11. 3400 RACEWAY
12. 1700 RACEWAY
13. AIR OUTPUT DUCT
14. CONTROL AND POWER CABLE DUCT
15. COVERED BASE ACCESS CUTOUTS
16. FLOOR CROSS DUCTS, CABLE
17. STORAGE AREA OR FUTURE WORKSHOP
18. FIRE EXTINGUISHER

Figure 1-16. Radio Transmitting Set AN/TRT-25 (Container TG4 LP Filter and Blower Installation) Isometric View

tribution circuit breaker panel, a 600/208-volt, 15-kva, 3-phase step-down transformer, and a fire extinguisher. Input to the step-down transformer is 600-volt, 3-phase power from the step-up transformer in container TE1. The step-down transformer furnishes 208-volt, 3-phase AC power to the distribution panel which houses circuit breakers for the motors, controls, lights and utility outlets in the helix container, and a circuit breaker for the lights mounted on the transmitting tower.

1-94. The interior of the helix proper is completely paneled with aluminum sheets which are heli-arc welded together to form a completely bonded inner skin. The components of the antenna matching network are fastened to the helix deck with non-ferrous bolts and screws. A heater, fan, and air intake vent are provided in the rear container wall. Air is exhausted through a hooded air vent in the front wall of the container.

1-95. A balanced line feed-through assembly that connects to a balanced 600-ohm transmission line from the AN/FRT-19 transmitter is recessed in the upper left side wall near the barrier door. A recessed single-ended RF feed-through that connects the helix with the low-frequency transmitting antenna is located in the upper front wall of the container.

1-96. INTERCONNECT GROUP OA-4916/TST-2.

Interconnect Group OA-4916/TST-2, container TD1, (see figure 1-19) houses four transmitting antenna coaxial patch panels, a dummy load, a dummy load patch panel and a dehydrator unit. The patch panels are utilized to patch transmitters to antennas or to the dummy load for test and maintenance.

1-97. The container is equipped with side doors at the rear that lead into container TE1 on the right and into a side-to-side walkway to TC1 on the left. One air conditioning unit is provided on the right outside wall. A fire extinguisher is provided on the left wall at the rear of the container. Signal and power duct are provided as shown. The patch panels, dummy load and dehydrator are installed down the center of the container and are secured to tapping plates in the floor.

1-98. The antenna patch panels are inter-connected by inter-panel trunks, and each panel can accommodate nine transmitters and nine antennas. A trunk is also provided to the dummy load patch panel from each antenna patch panel. The dummy load can handle up to a maximum of 25 kilowatts, average power. The transmitter interlock and radiation indicator circuits are extended to these patch panels. An interlock circuit on the patch panel closes when a patch to an antenna or to the dummy load is completed. A transmitter to dummy load connection requires two patches, one at the antenna patch panel and one at the dummy load patch panel. Nine radiation indicator lamps are provided on the front of each antenna patch panel, one for each transmitter position, and when high voltage is applied to a transmitter the associated radiation indicator lamp is lighted.

1-99. Coaxial cables from the transmitters and the antennas are brought in through heliax feed-through fittings in the floor of the container behind the patch panels. Each feed-through fitting is equipped with a gas barrier. The dehydrator unit is used to maintain low pressure dehydrated air in the air-deilectric coaxial cables to the transmitters and antennas. Dehydrated air is furnished to the coaxial cables through air lines connected to the feed-through fittings. A valve and pressure gauge is provided for each air line.

1-100. The container power distribution panel and air-conditioner control unit are mounted on the right rear wall. The power panel houses circuit breakers for the air conditioner and its control unit, dummy load, dehydrator unit and container lighting.

1-101. INTERCONNECT GROUP OA-4918/TST-2.

Interconnect Group OA-4918/TST-2, container TG1, (see figure 1-20) is identical in construction and equipment layout except it is a mirror image of container TD1 described in paragraph 1-96. The two containers are butted end-to-end in the center of the transmitter complex providing one large RF distribution area.

1-102. MAINTENANCE EQUIPMENT GROUP OA-4917/TST-2.

Maintenance Equipment Group OA-4917/TST-2, container TF1, (see figure 1-21) provides the electronics repair and supply facility for the Transmitting Central. The container is divided into a repair area at the rear and a supply area at the front by a partition in the center. A doorway is provided in the center of the partition. A removable end wall with an emergency exit door is installed at the front of the container. Two side doors are provided at the rear, one leading to a side-to-side walkway into container TE1 and the other to the outside. One air conditioning unit is mounted on the right outside wall. A fire extinguisher supported on a wall mounted bracket is located on the right rear wall.

1-103. The left side of the repair area contains three work benches that are equipped with drawers for tool storage. A utility shelf, utility outlets and jacks are mounted on the wall above the workbenches. The jacks are wired to trunks that terminate on the MDF in container TC1. A vise and bench grinder are mounted on the workbenches. A floor-mounted drill press and three metal storage cabinets are provided on the right side of the repair area. The cabinets are equipped with shelves and doors and are used to store test equipment and vacuum tubes. A power distribution panel that houses circuit breakers for the lighting, utility outlets, air conditioning unit and power tools is wall mounted beside the left side door. A control for the air conditioning unit is mounted on the power panel.

1-104 The supply area is equipped with five bin storage cabinets along the left wall and storage shelves in the center and along part of the right wall. A storekeepers desk, a catalogue shelf, a desk light, a utility outlet and a cushioned, adjustable, caster chair is pro-

assembly in the right wall just aft of the partition, and connects to the side of the low-pass filter assembly through a short section of 600-ohm balanced line. The balanced output of the low-pass filter assembly is connected from the top of the CU-1056 directional coupler to a feed-through assembly installed in the upper left wall of the container.

1-84. The low-pass filter is mounted on a base which provides a service space under the filter unit. A cylinder of compressed gas, used to pressurize the low-pass filter capacitors, is mounted on the floor under the directional coupler. The pressure gauges and manifolds for the capacitor gas lines are mounted in a cabinet to the left of the directional coupler. The gas lines are run from the manifolds through the base of the low-pass filter unit to the capacitors.

1-85. The centrifugal fan assembly has been removed from its original housing and is mounted on the floor of container TG4. The blower units are secured to tapping plates in the floor. Air intake to the power units is through three screened vents in the left wall of the container. Forced air from the blower units is fed to the power amplifier compartment of the transmitter through the duct installed in the lower right wall and the air duct that is installed between TG4 and TH4.

1-86. A cable duct which carries power and control wiring from the transmitter to the low-pass filter, centrifugal fan assembly and directional coupler is installed between the center cross-container cable ducts of TG4 and TH4. Motor control units for the centrifugal fans are mounted on the left wall just forward of the side door in TG4. An auxiliary power distribution panel and power entrance kickplate are mounted on the left wall at the rear. Primary power to this panel, which houses circuit breakers for the air conditioner and its control unit, lighting and utility outlets in TG4, is furnished from the power distribution container GT1. The air-conditioner control unit is mounted on the left wall in the front compartment.

1-87. RADIO TRANSMITTING SET AN/TRT-19.

Radio Transmitting Set AN/TRT-19, container TE1, (see figure 1-17) houses three low-frequency transmitters. A 15-kilowatt AN/FRT-19 transmitter is mounted in the rear half of the container, and two 2-kilowatt TAB-7 transmitters occupy the front half. The AN/FRT-19 operates into a low-frequency transmitting tower through the antenna coupler group OA-4940/TST-2, helix container, which houses the antenna matching network. The AN/FRT-19 operates in the frequency range of 30 to 600 kilocycles and may be used for CW, RATT or Facsimile transmission. The TAB-7 transmitters provide CW transmission in the frequency range of 100 to 555 kilocycles. Two air conditioning units, mounted on the outside left wall, are provided for this container. The front end is equipped with a removable end wall.

1-88. The transmitters are mounted down the center of the container providing access from the front and the rear for maintenance. The front and rear doors of the AN/FRT-19 are re-hung on removable pin type hinges. The TAB-7 transmitters are equipped with panels that fasten to the frame with thumbscrews. Air intake vents are provided at the rear of the AN/FRT-19 transmitter. An exhaust ventilation duct is provided from the final amplifier to the upper left sidewall of the container. The TAB-7 transmitters require no forced air ventilation and are not equipped with ventilation ducting.

1-89. The AN/FRT-19 employs balanced line feed to the helix container. A section of balanced line connects the transmitter RF output terminals to a recessed balanced feed-through assembly in the upper left wall. The TAB-7 transmitters are equipped for single-ended RF output. The single-ended output of each transmitter is connected to a CAY-24145 antenna disconnect switch on top the transmitter and from the switch to a recessed, insulated feed-through in the upper left wall.

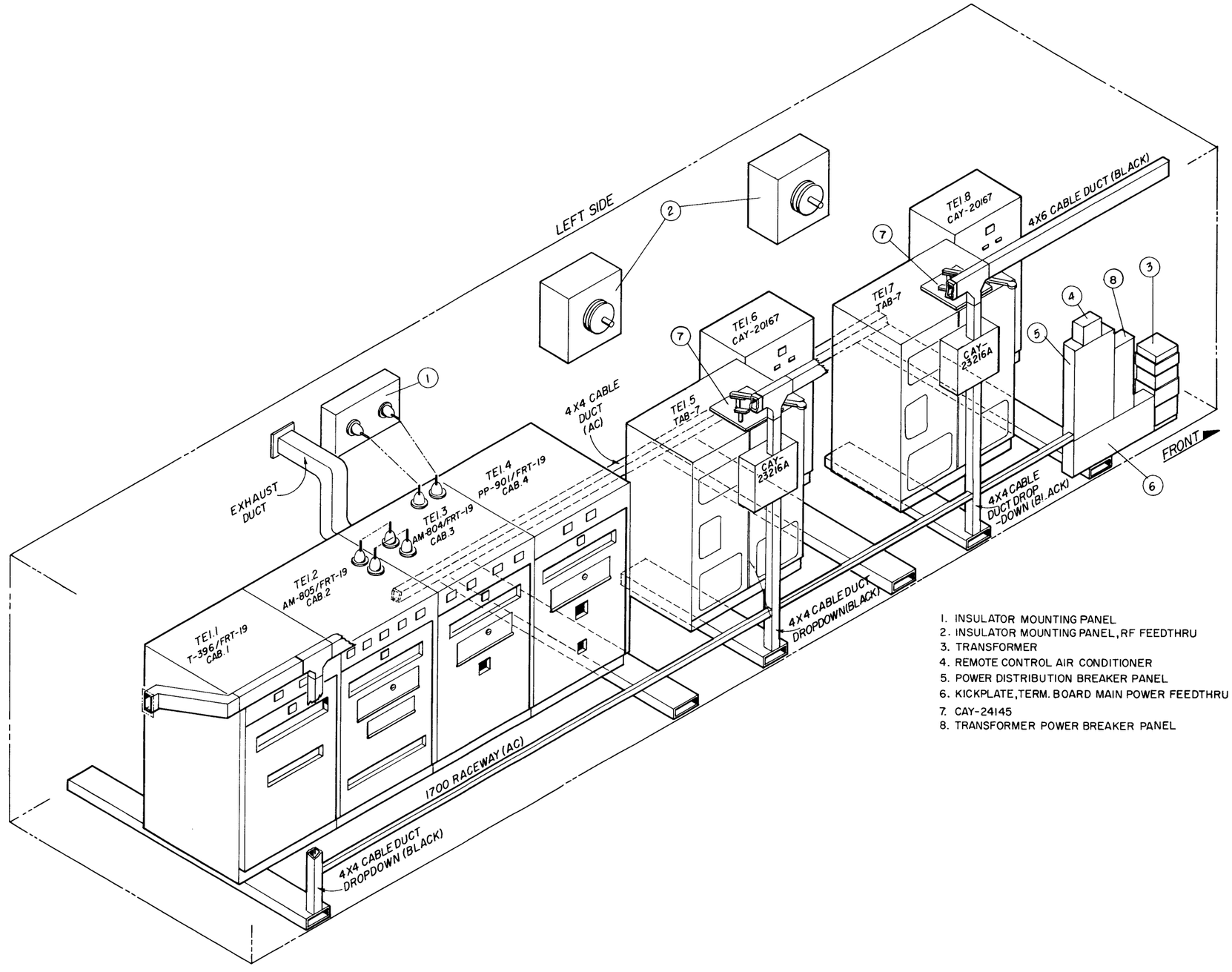
1-90. A power distribution panel, a transformer circuit breaker, and a 208/600-volt, 15-kva, 3-phase step-up transformer are mounted at the front on the right side of the container. The power distribution panel and the transformer circuit breaker are fed by separate power runs from the power distribution container GT1. The circuit breaker feeds the transformer which provides power for the helix container and the low-frequency antenna tower lighting. The voltage is stepped-up to reduce the size of the power feeders from container TE1 to the helix container. The power distribution panel houses circuit breakers for the transmitters, air conditioning units, air-conditioner control unit, lighting and utility outlets in container TE1. Utility outlets are provided in the 1700 raceway that is installed along both walls of the container. Control of both air conditioning units is provided by the air-conditioner control unit that is mounted on the power distribution panel.

1-91. Signal ducting is provided on the right wall of container TE1 as shown. Signal, RF monitor; and radiation indicator circuits from each transmitter are extended to the transmitter control container TC1. Signal cables for the TAB-7 transmitters are terminated in the CAY-23216A Land-Line Control Units located on the right wall. Signal cables for the AN/FRT-19 are run directly into the transmitter.

1-92. ANTENNA COUPLER GROUP OA-4940/TST-2.

Antenna Coupler Group OA-4940/TST-2, helix container, (see figure 1-18) houses the antenna matching network which couples the AN/FRT-19 transmitter located in container TE1 with a 630-foot low-frequency tower. The helix container is installed in the antenna field near the transmitting tower.

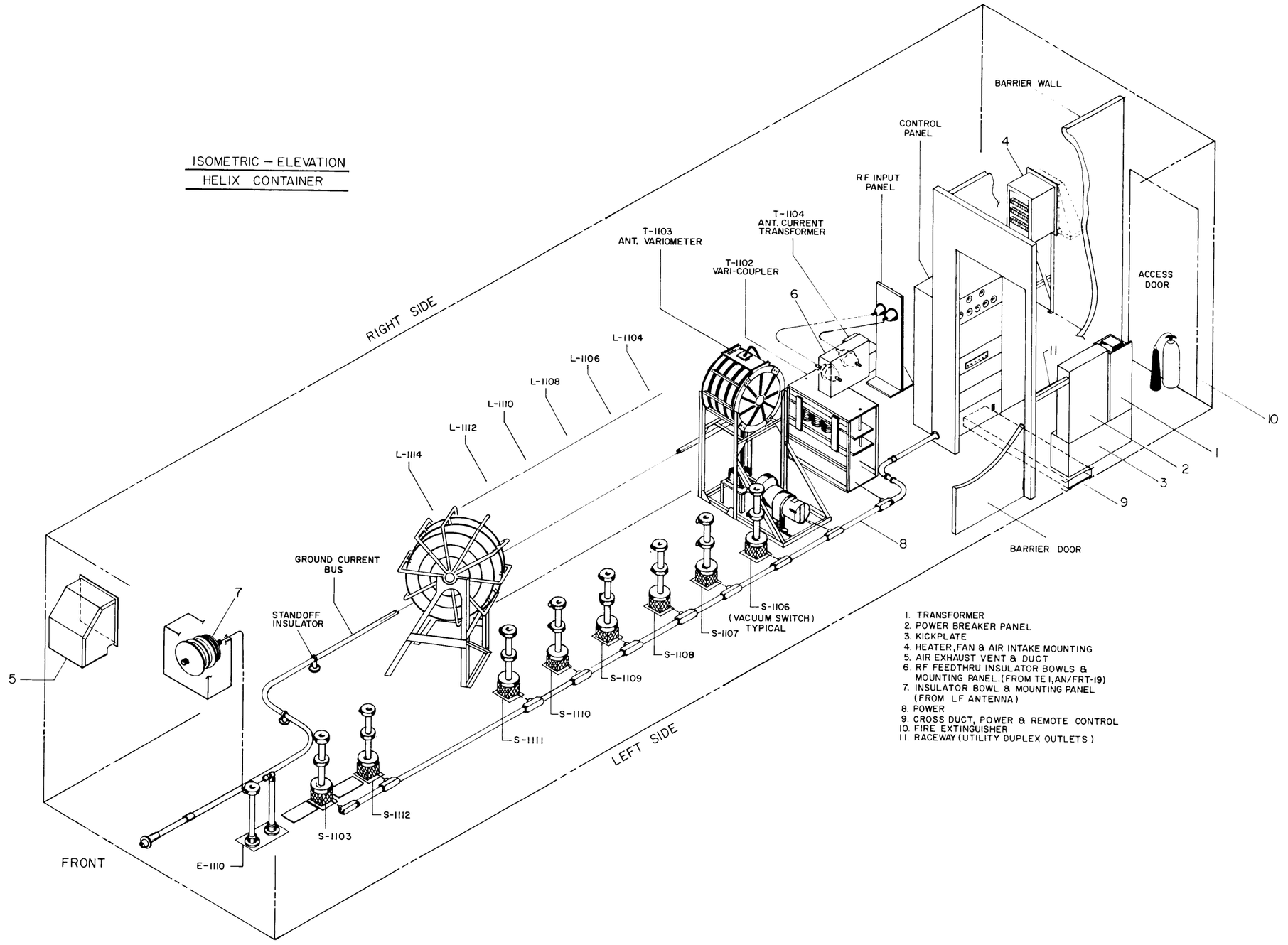
1-93. An access door at the rear of the container leads into a vestibule that has a barrier door leading into the helix proper. The barrier door is equipped with a safety interlock which shuts down the AN/FRT-19 transmitter when the barrier door is opened. The vestibule contains a helix control panel, a power dis-



1. INSULATOR MOUNTING PANEL
2. INSULATOR MOUNTING PANEL, RF FEEDTHRU
3. TRANSFORMER
4. REMOTE CONTROL AIR CONDITIONER
5. POWER DISTRIBUTION BREAKER PANEL
6. KICKPLATE, TERM. BOARD MAIN POWER FEEDTHRU
7. CAY-24145
8. TRANSFORMER POWER BREAKER PANEL

Figure 1-17. Radio Transmitting Set AN/TRT-19 (Container TE1) Isometric View

ISOMETRIC – ELEVATION
HELIX CONTAINER



1. TRANSFORMER
2. POWER BREAKER PANEL
3. KICKPLATE
4. HEATER, FAN & AIR INTAKE MOUNTING
5. AIR EXHAUST VENT & DUCT
6. RF FEEDTHRU INSULATOR BOWLS & MOUNTING PANEL. (FROM TE1, AN/FRT-19)
7. INSULATOR BOWL & MOUNTING PANEL (FROM LF ANTENNA)
8. POWER
9. CROSS DUCT, POWER & REMOTE CONTROL
10. FIRE EXTINGUISHER
11. RACEWAY (UTILITY DUPLEX OUTLETS)

Figure 1-18. Antenna Coupler Group OA-4940/TST-2 (Helix Container) Isometric View

vided in the storage area between the partition and the storage shelves on the right side.

1-105. TEST EQUIPMENT SUPPLIED, OA-4917/TST-2, CONTAINER TF1.

Test equipment and accessories furnished for the electronics repair facility in container TF1 are listed in Table 1-1.

1-106. POWER DISTRIBUTION GROUP OA-4921/TSQ-55.

Power Distribution Group OA-4921/TSQ-55, container GT1, is the AC power distribution center of the Transmitting Central. Container GT1 houses a main power bus and circuit breakers through which primary AC power is distributed to all containers and antenna field equipment at the transmitter site.

1-107. POWER DISTRIBUTION GROUP OA-4922/TSQ-55.

Power Control Group OA-4922/TSQ-55, container GT2, is the AC power control center of the Transmitting Central. Container GT2 houses a power control console and twelve 1600-ampere electrically operated circuit breakers. The diesel engines, generators, and circuit breakers of electric power plant AN/TSQ-55 may be controlled electrically from the power control console. Voice inter-communication is provided with container TC1 through a voice INTERCOM unit that is installed in the control console. Container GT2 is equipped with one air conditioner.

1-108. DIESEL ENGINE GENERATOR SET PU-600/TSQ.

Containers GT3, GT4, GT5 and GT6 are PU-600/TSQ Diesel Engine Generator Sets. Each of these containers houses three diesel-driven 335-kilowatt, 208-volt, 3-phase, 60-cycle generators. The sidewalls of the containers open to provide a walkway and a canopy.

NOTE

Illustrations and a detailed description of the Electric Power Plant AN/TSQ-55 containers are provided in the following instruction manual which is furnished with the system:

Transportable Communication System SYM-2005 (AN/TSC-35) Primary Power System.

TABLE 1-1. TEST EQUIPMENT SUPPLIED, OA-4917/TST-2, (CONTAINER TF1)

MODEL	QUANTITY	NAME
DT-104	1	Character Generator (TTY)
LA-80B	2	EPUT Meter
LA-915A	1	Converter
SG-25	2	Signal Generator
SG-1000	1	Megger
ZM-11/U	1	Impedance Bridge
2-16	1	Impedance Bridge
200-CD	1	Test Oscillator
260A	1	Q Meter
260	6	Volt-Ohm-Milliammeter
304A	2	Oscilloscope
304AR	1	Oscilloscope
400D	2	VTVM
410B	3	VTVM

TABLE 1-1. TEST EQUIPMENT SUPPLIED, OA-4917/TST-2, (CONTAINER TF1) (CONT)

MODEL	QUANTITY	NAME
535A	2	Oscilloscope
Type CA	1	Dual-Trace Preamplifier
751	1	Transmission Line Fault Locator
752	1	Vacuum Tube Tester
916-AL	1	RF Bridge
1606A	1	RF Bridge
1890M	1	Transistor Test Set
8150	1	EPUT Counter
90651	1	Grid Dip Meter
185A-500-FN	1	Average-Reading Termination Wattmeter
500A	1	Scopemobile
161	3	Service Cart

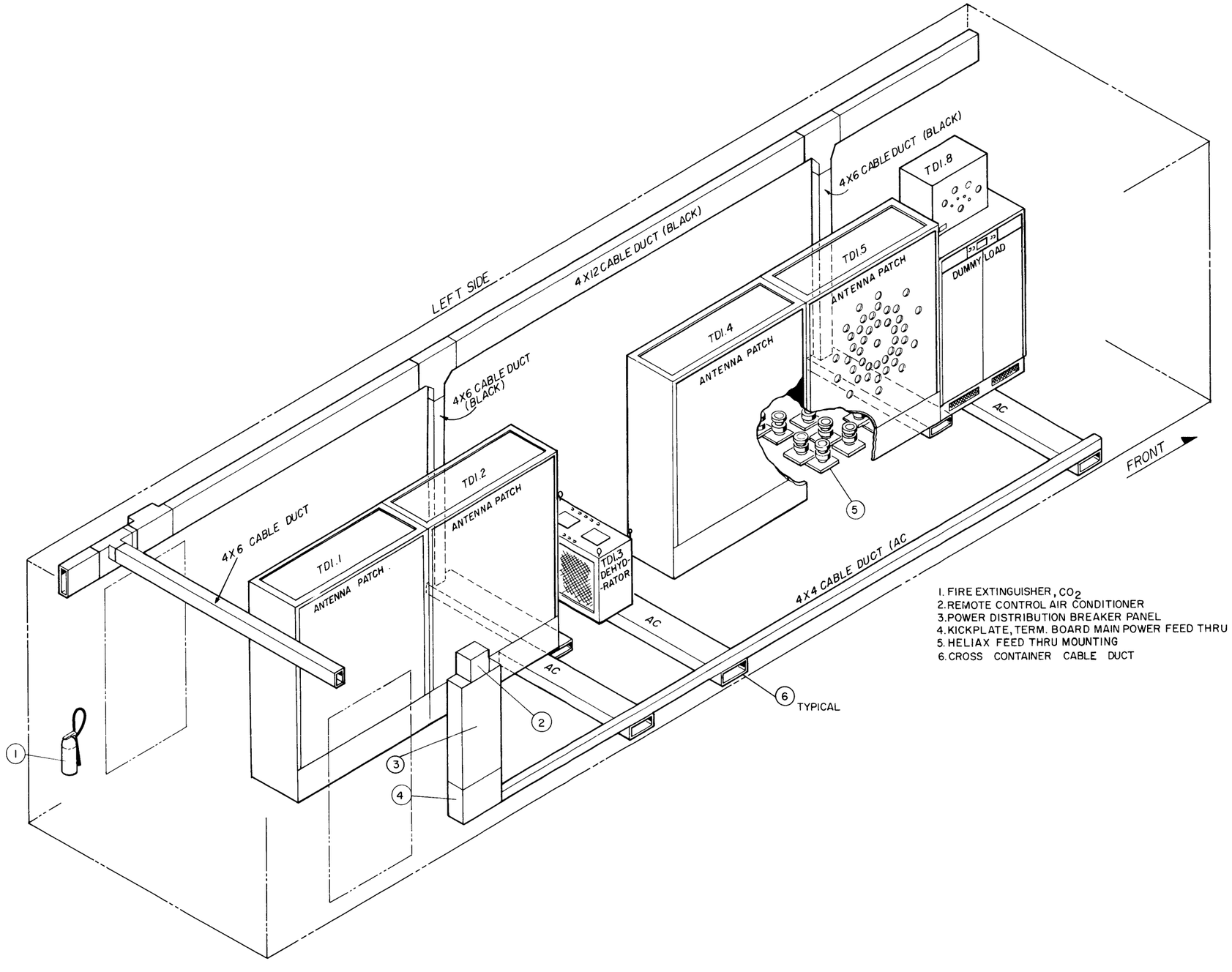
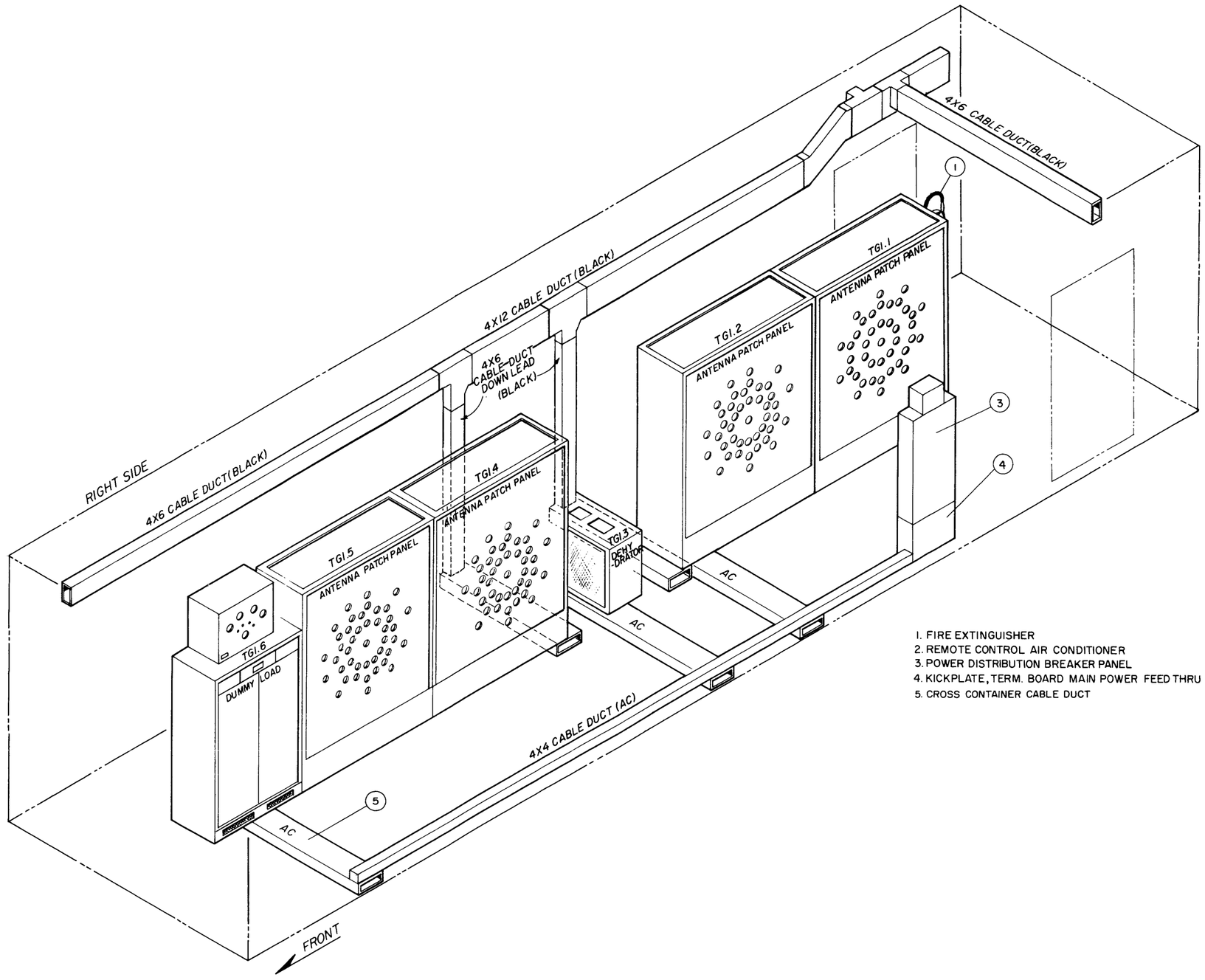


Figure 1-19. Interconnect Group OA-4916/TST-2 (Container TD1) Isometric View



1. FIRE EXTINGUISHER
2. REMOTE CONTROL AIR CONDITIONER
3. POWER DISTRIBUTION BREAKER PANEL
4. KICKPLATE, TERM. BOARD MAIN POWER FEED THRU
5. CROSS CONTAINER CABLE DUCT

Figure 1-20. Interconnect Group OA-4918/TST-2 (Container TG1) Isometric View

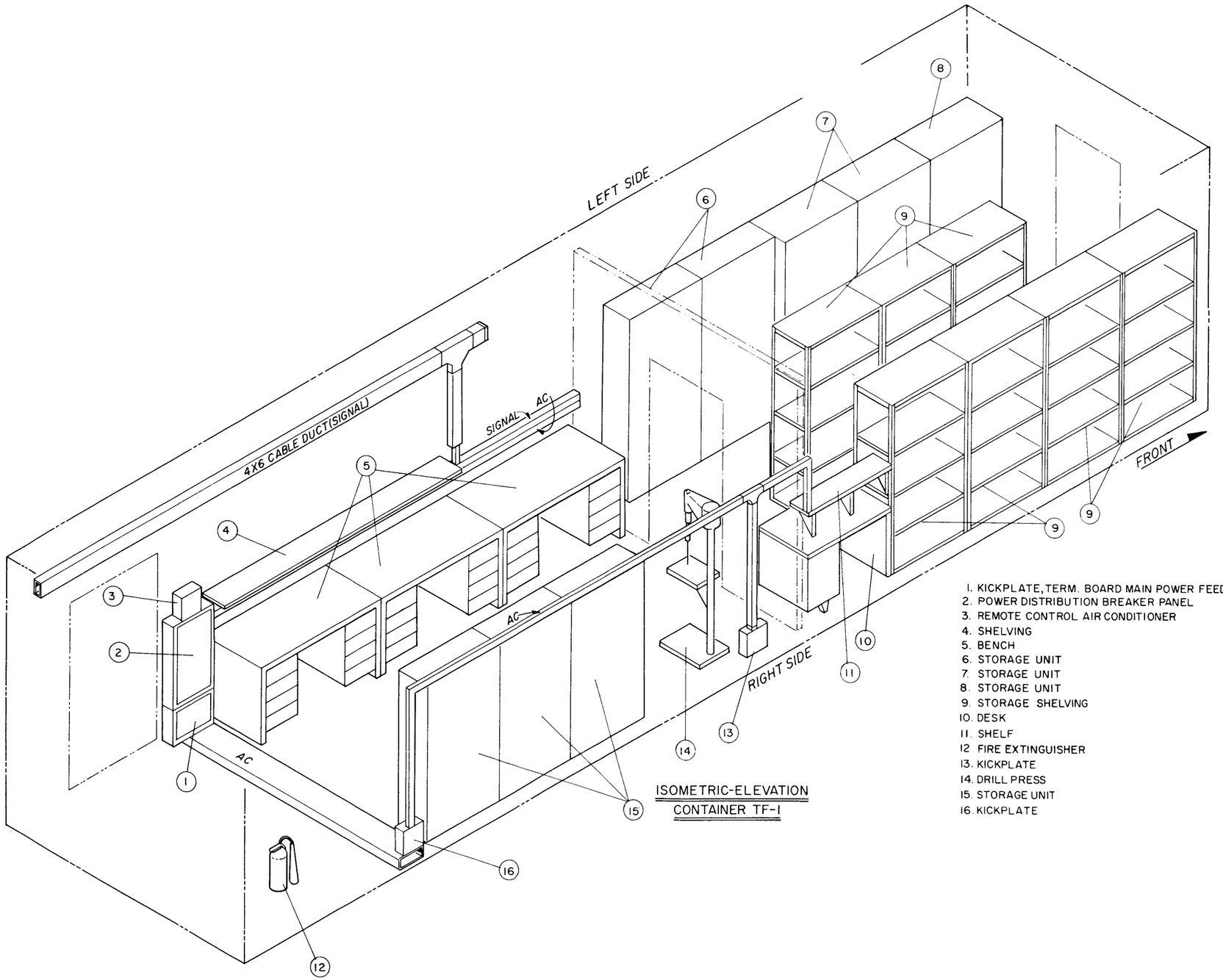


Figure 1-21. Maintenance Equipment Group OA-4917/TST-2 (Container TF1) Isometric View

SECTION II
INSTALLATION

2-1. INTRODUCTION.

This section contains a detailed plot plan of the Transmitting Central antenna field and installation details of the RF distribution system, the grounding system, and primary power distribution cabling. Installation details for installing the transmitter site containers, electrical power generating and distribution system, and antennas are contained in separate manuals supplied with the system.

2-2. ANTENNA FIELD, TRANSMITTING CENTRAL AN/TST-2.

A detailed plot plan of the Transmitting Central antenna field is illustrated in figure 2-1. Antennas installed at the Transmitting Central include the following types and quantities:

a. Ten Rotatable Log-Periodic, 6.5 to 60 megacycles, type 237A-1A.

b. Ten Conical Monopole, 2 to 8 megacycles, type OCM-68.

c. Eight Conical Monopole, 4 to 16 megacycles, type OCM-28.

d. Ten Conical Monopole, 7 to 28 megacycles, type OCM-17.

e. One Conical Monopole, Tuned, 4 to 30 megacycles, type 775.

f. Fourteen 3-Wire Vertical Doublet, 6 to 32 megacycles, type FDA-3-600R.

g. Two Low-Frequency Longwire, 417-foot and 917-foot, type TLW.

h. Six Dual Nested Rhombic.

i. Two Single Rhombic.

j. One Pan Polar Low-Frequency Tower, 630-foot.

k. One Low-Frequency Tower, 353-foot.

l. One UHF, 225 to 400 megacycles, type AT-50.

2-3. RF DISTRIBUTION SYSTEM, TRANSMITTING CENTRAL.

The RF distribution system at the Transmitting Central employs both balanced and unbalanced feed from transmitters to antennas. Open-wire, 600-ohm transmission line is used for balanced feed and flexible coaxial cable for unbalanced feed. Unbalanced feed is provided to the conical monopole and log-periodic antennas. A combination of unbalanced and balanced feed is used for vertical doublet antennas. The unbalanced outputs of all high-frequency transmitters are terminated on coaxial patch panels in containers TD1 and TG1 where they are program-patched to the desired antennas. The low-frequency, high-power AN/FRT-19 and AN/FRT-61 transmitters use balanced feed to the helix.

2-4. BALANCED OPEN-WIRE TRANSMISSION LINES.

The 600-ohm, open-wire balanced transmission lines are supported on poles at a minimum height of fifteen feet above ground level. A distance of ten feet is maintained between adjacent transmission lines. Number 6 copperweld wire is used for the conductors which are spaced at 12-inch centers by insulators on the pole crossarms and other insulators spaced at regular intervals between the poles. The locations of the poles is shown in figure 2-2. Each pole location is marked by a cross (+) and a letter indicating the pole type. The indicated azimuth and distance at pole locations are referenced to point C_O in the figure. Details of seven types of poles used in this installation are shown in figure 2-3. Figure 2-4 illustrates installation details of the crossarms, insulators, and guy wires. Figure 2-5 illustrates the types of junctions employed to group transmission-line runs in the vicinity of the transmitter containers. Figure 2-6 illustrates a typical balun installation that is used to convert from unbalanced to balanced feed.

2-5. COAXIAL CABLES.

Coaxial cables used to connect the unbalanced output of high-frequency transmitters to coaxial patch panels are 3-inch air dielectric (HJ8-50A) cable for the AN/FRT-40B transmitters, 1 5/8-inch air dielectric (HJ7-50) cable for the AN/FRT-39 transmitters, and 7/8-inch foam heliax (FHJ-5) for the AN/URT-19(V) transmitters. The air-dielectric HJ8-50A coaxial cable is used from the coaxial patch panels to antennas and to baluns in the antenna field. All air-dielectric cables are pressurized with dry air by dehydrator units which are located in the RF distribution containers. The coaxial cable is run at ground level or in trenches. At road crossings, the coax is run through conduit installed at least 18 inches below the road surface.

2-6. RF PATCHING, TRANSMITTERS.

Four Andrews type 27935, 50-ohm patch panels are installed in both container TD1 and container

TG1. Each of these patch panels is capable of connecting any one of ten transmitters to any one of ten antennas, or to a dummy load. To provide greater flexibility for the antenna patching system, one or two transmitter outputs and antenna inputs of each patch panel are used as inter-panel trunks. The trunks connects all four patch panels in the container together so that any antenna is available to any transmitter output. In addition, a dummy-load patch panel and a dummy load are installed in each of the RF distribution containers. The dummy loads are used in conjunction with those transmitter outputs that terminate in their respective containers.

2-7. COAXIAL PATCH PANEL.

Figure 2-7 shows the front panel layout of the coaxial patch panel. The center connector, DL, is the dummy load input. The first ring of connectors, T1 through T10, are transmitter outputs and the second ring of connectors, A1 through A10 are antenna inputs. Connectors T9, T10, A9 and A10 are used for inter-panel trunks, and are connected from an antenna connector on one panel to a transmitter connector on the adjoining panel. The remaining connectors, L1A through L10A and L1B through L10B, are lateral trunk links for trunking from one area of the patch panel to another area of the same patch panel. Figure 2-8 is a rear view of a coaxial patch panel that shows the lateral trunk links.

2-8. The coaxial patch panels have been modified by the addition of nine radiation indicator lamps on the upper left side of the front panels. One lamp is associated with each transmitter output. The lamps are wired to terminals on TB-6 and TB-12 (see figure 2-8) at the rear of the panels connecting to radiation indicator cables from the transmitters which are also wired to these terminals. The radiation indicator circuits are extended from TB-6 and TB-12 to the transmitter alarm panels in control container TC1. The external interlock circuits, which are extended to the coaxial patch panels from all high-frequency transmitters, are wired to terminal board TB-2.

2-9. GROUND SYSTEM INSTALLATION, TRANSMITTING CENTRAL.

The interior ground bus installed in the floor of each transmitter container is constructed of 1 1/2-inch by 3/8-inch copper bus bar. The bus bar is imbedded in the floor extending the full length of the container. Threaded 1/2-inch copper studs (see figure 2-9) are welded to the top of the bus bar at equipment locations in the container. All equipment racks, cabinets and the AC power neutral inside the container are tied to the interior ground bus using the studs for connection points. Three studs welded to the bottom of the bus bar extend through the floor at both ends and at the center of each transmitter container as shown in figure 2-10. A connection is made from each of these studs to an earth ground rod using 4/0 bare copper cable as shown.

2-10. The ground system for the AN/FRT-62 transmitter in container TH3 is illustrated in figure 2-11. Additional grounding for the high power transmitter is provided by copper straps which are connected to the ground bus bar as shown. The straps provide five additional grounding points for the transmitter. Three straps are connected to the base shields of the transmitter, and two extend through the floor and are connected to additional ground rods as shown.

2-11. SIGNAL GROUNDING.

The drain wires of all shielded signal cables at the Transmitting Central are tied to a common point at the MDF in container TC1. At the equipment end of the signal cables, the drain wires are not connected to the equipment, but are insulated with shrink tubing to avoid creating ground loops in the signal ground system. The common signal ground point is connected to the AC power neutral connection in the container using a number 4 AWG insulated cable.

2-12. EARTH GROUND SYSTEM.

The earth ground installation at the Transmitting Central is shown in figure 2-12. Ground rods are driven into the earth as indicated and adjacent rods are tied together using a size 4/0 bare copper cable. When the containers are assembled in their positions, the ground bus in each transmitter container is tied to the ground bus in each adjoining container and to the earth ground forming one continuous ground in the complex.

2-13. PRIMARY POWER DISTRIBUTION, TRANSMITTING CENTRAL.

Primary AC power for the Transmitting Central is furnished by Electric Power Plant AN/TSQ-55 which consists of OA-4921/TSQ-55 Power Distribution Group container GT1, OA-4922/TSQ-55 Power Control Group container GT2, and four PU-600/TSQ Diesel Generator Set containers GT3 through GT6. Figure 2-13 is a single-line power flow diagram showing 3-phase, 4-wire cabling from the generator containers to the distribution container GT1. Each power run in the figure represents eight 500MCM cables, two for each phase and two for the neutral. Circuit breakers indicated in the figure are type DB-50, 3-phase breakers that are adjustable from 1200 to 1600 amperes.

2-14. The power cables are supported on cable hangers underneath the containers and walkways, and are run into the control and distribution containers through feed-throughs under the circuit breaker panels. Each PU-600/TSQ container houses three diesel-driven 335-kilowatt, 208-volt, 3-phase generators. The power output of each generator is fed to a separate circuit breaker in control container GT2, and then fed to container GT1 where all generator outputs are commoned at a main power bus.

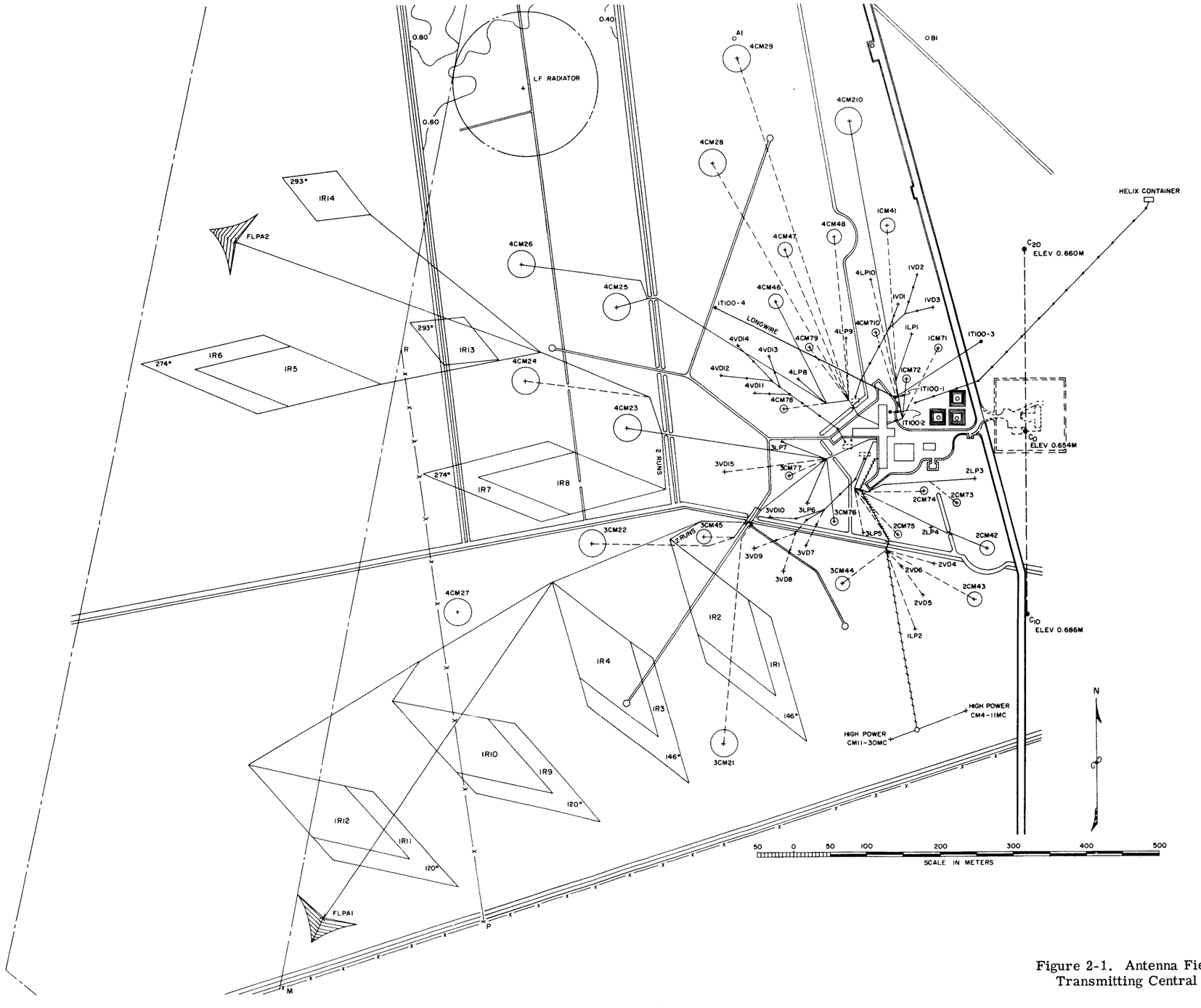
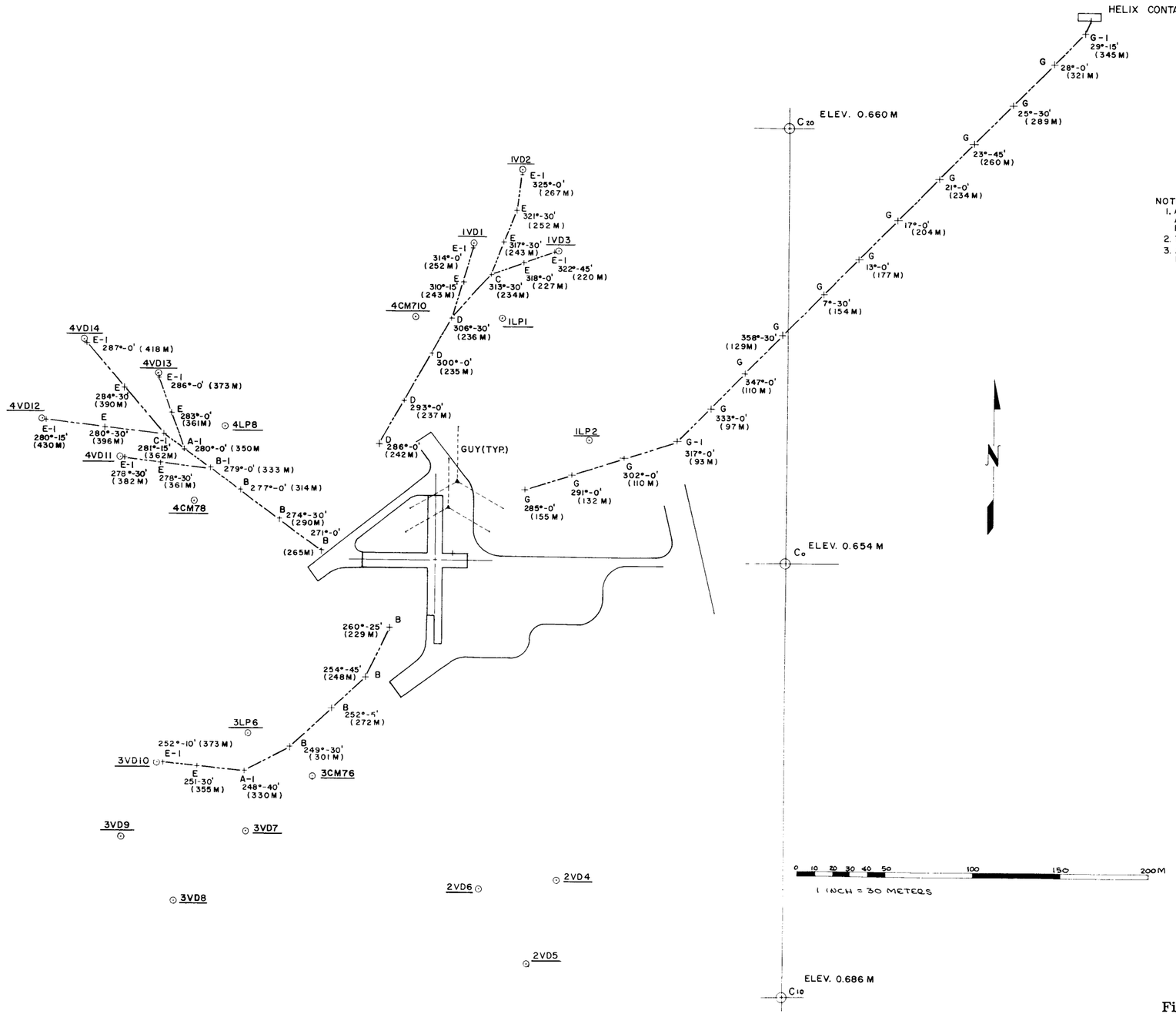


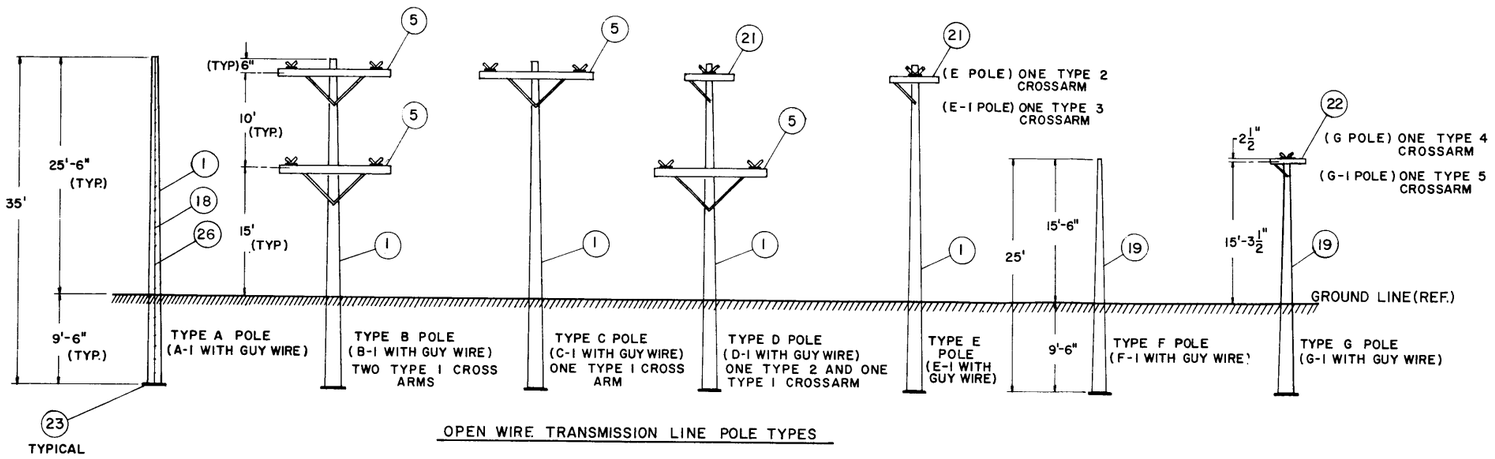
Figure 2-1. Antenna Field Plot Plan, Transmitting Central AN/TST-2



NOTES:
1. ALL AZIMUTHS ARE GIVEN RELATIVE TO TRUE NORTH. THOSE SHOWN ARE FOR POLE(OPEN WIRE TRANSMISSION)LOCATIONS. REFER TO TMCS DWG. A66-TS-0289 FOR POLE TYPE DETAILS.
2. THE AZIMUTHS FOR THE BASE LINE $C_{10} - C_o - C_{20}$ IS 359°-54'
3. AZIMUTHS SHOWN AT POLE LOCATIONS ARE FROM C_o. SEE TABLE FOR AZIMUTHS FROM C_{10} AND C_{20}

ANTENNA & TYPE OF POLE	AZIMUTHS FROM C_{10}	AZIMUTHS FROM C_{20}
IVD2		
E-1	341°-35'	259°-50'
E	340°-30'	253°-0'
E	338°-58'	248°-10'
IVD3		
E-1	342°-30'	242°-0'
E	340°-0'	243°-0'
C	337°-25'	243°-40'
IVD1		
E-1	336°-55'	249°-0'
E	335°-20'	244°-30'
D	333°-15'	240°-30'
D	330°-50'	237°-40'
D	326°-50'	234°-40'
D	322°-15'	232°-15'
HELIX		
G-1	17°-25'	72°-0'
G	16°-0'	76°-15'
G	14°-30'	84°-0'
G	12°-20'	94°-30'
G	10°-45'	108°-30'
G	8°-10'	130°-0'
G	5°-40'	152°-0'
G	3°-0'	168°-0'
G	359°-40'	181°-32'
G	356°-5'	190°-0'
G	352°-30'	195°-30'
G-1	348°-45'	199°-32'
G	343°-5'	206°-30'
G	337°-15'	212°-0'
G	332°-30'	216°-15'
4VD14		
E-1	312°-13'	253°-0'
E	312°-0'	248°-30'
C-1	311°-25'	243°-45'
4VD13		
E-1	314°-0'	248°-0'
E	313°-0'	245°-0'
A-1	311°-45'	242°-0'
4VD12		
E-1	307°-25'	248°-25'
E	309°-55	246°-0'
4VD11		
E-1	308°-30'	243°-30'
E	309°-55'	242°-0'
B-1	311°-55'	239°-30'
B	312°-10'	236°-30'
B	312°-50'	232°-25'
B	313°-25'	227°-45'
3VD10		
E-1	290°-0'	224°-30'
E	290°-45'	223°-0'
A-1	292°-0	220°-0'
B	296°-25'	219°-0'
B	302°-0'	218°-0'
B	306°-50'	217°-25'
B	312°-30'	218°-30'

Figure 2-2. Open-Wire Transmission Line Pole Locations, Transmitting Central AN/TST-2



OPEN WIRE TRANSMISSION LINE POLE TYPES

BILL OF MATERIAL

ITEM	REQ.	PART NO.	DESCRIPTION
1			35' SOUTHERN YELLOW PINE POLE, CLASS 4 8 POUND CREOSOTE
2		LSI-120	WIND TURBINE OPEN WIRE TRANSMISSION LINE INSULATOR
3		5602 1/4	FETTER LAG SCREW FOR 13/32 DIA. HOLE
4		7813	HUBBARD SQUARE WASHER
5			4"W X 5"H X 12'-0"L, FIR CROSSARM, NO. 6 PENTA
6		9707	1/2 X 7 MACHINE BOLT & NUT
7		7811	2" X 2" X 1/8", SQUARE WASHER, 1/2 BOLT
8		7812	2" X 2" X 1/8", SQUARE WASHER, 5/8 BOLT
9		9714	5/8 X 14 MACHINE BOLT & NUT
10		7822	2 1/2 X 2 1/2 X 3/16, CURVED WASHER, 5/8 BOLT
11		7944	CROSSARM ANGLE BRACE
12		32489	LAPP, CLEVIS, ONE (1) WAY
13		9035,36,37	LAPP, CLEVIS
14		25609	LAPP, INSULATOR
15		5095	POLE GAIN (WHERE REQUIRED)
16		7813	HUBBARD SQUARE WASHER.
17		39960	HUBBARD 5/8 X 10 EYE BOLT
18		AWG	NO. 6 COPPERWELD WIRE, TRANS.
19			25' SOUTHERN YELLOW PINE, CLASS 6 8 POUND CREOSOTE
20		GRAYBAR	NO. 165V, SOLDERLESS CONNECTOR
21			4" X 5" X 3'-0"L, FIR CROSSARM, NO. 6 PENTA
22			4" X 5" X 2'-0"L, FIR CROSSARM NO. 6 PENTA
23		PBG	WEAVER POLE BOTTOM GROUND PLATE
24			NO. 8 SOFT DRAWN COPPER WIRE, TY-WRAP
25		8024	HUBBARD FLAT CROSSARM BRACE
26		77493	COPPERWELD ROLLED-POINT STAPLES
27		9753	HUBBARD, LAG SCREW, 1/2 X 3
28		PSU-415	PLASTIC SPACER UNIT FOR 12" SPACING
29		39956	HUBBARD, EYE BOLT, 5/8 X 6
30			.010 COPPER SHEET, 4" WIDE
31		9812	5/8 X 12 MACHINE BOLT & NUT
32		9755	HUBBARD, LAG SCREW, 1/2 X 5
33		8887	HUBBARD, CURVED LIFT PLATE
34		9152	HUBBARD, ANGLE THIMBLE EYE BOLT
35		7450	HUBBARD, 3 BOLT MEDIUM GUY CLAMP, 6" LONG
36		5102	RELIABLE, STRANDVISE, 3/8
37		7528A	HUBBARD, ANCHOR SCREW, 8" WING, 5'-6" O/A
38			7/16" SPECIFIED GRADE GUY WIRE
39		9810	5/8 X 10 MACHINE BOLT & NUT

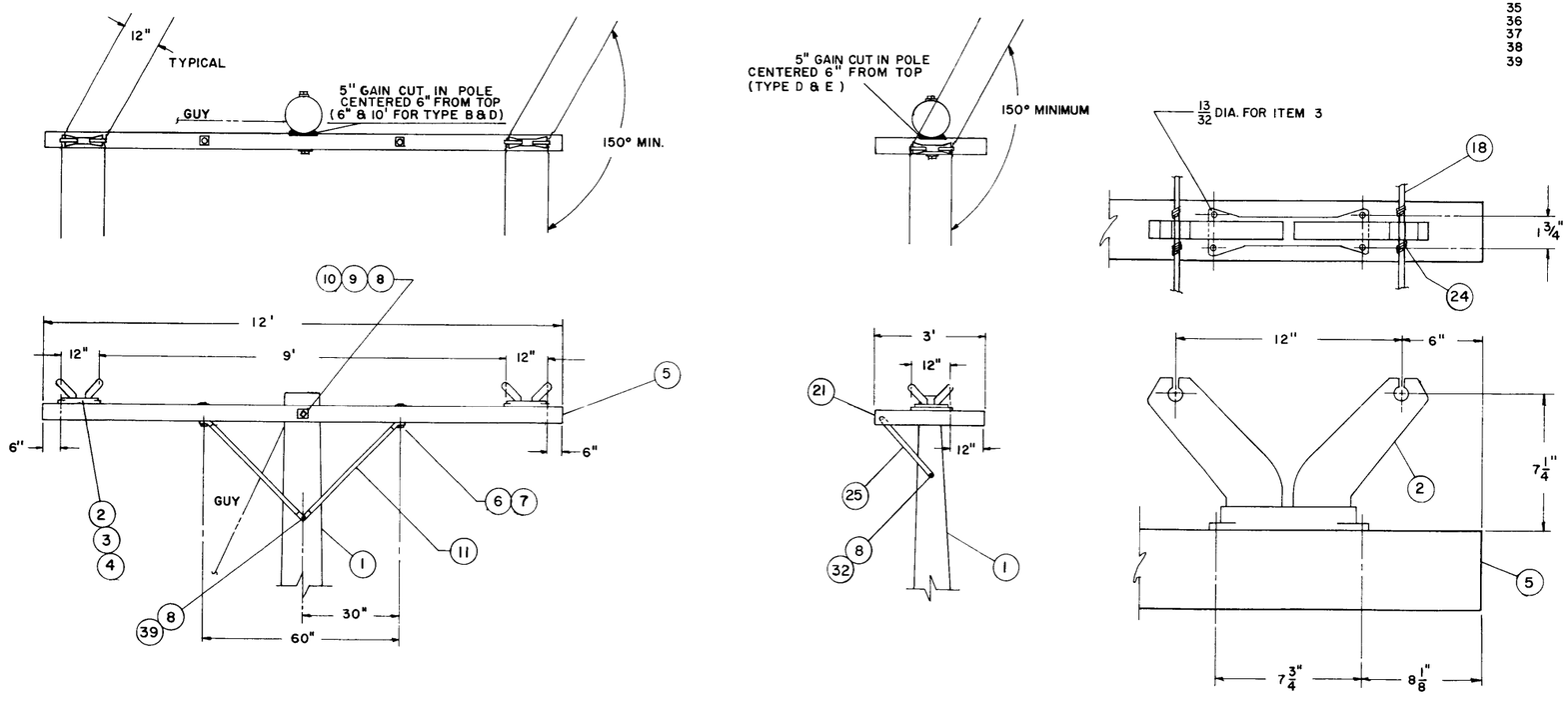
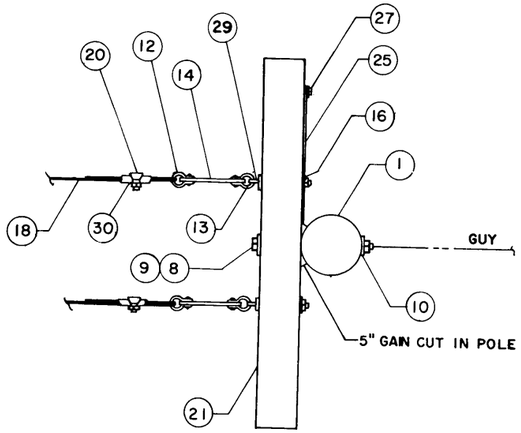
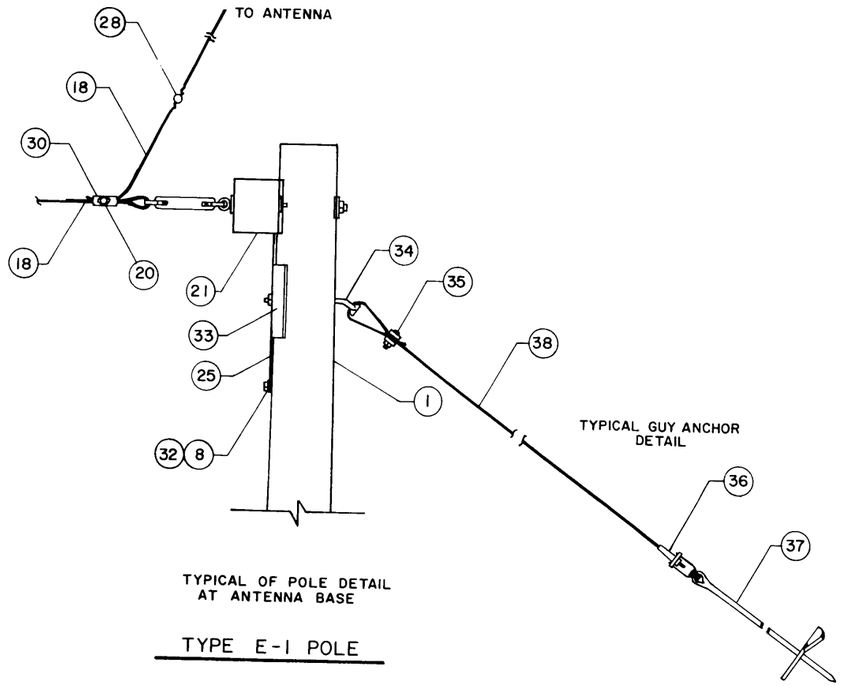
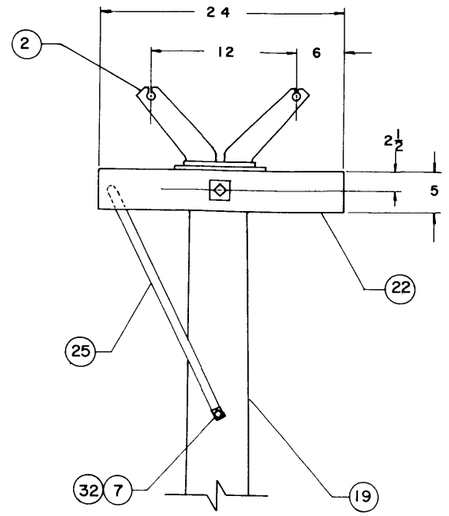


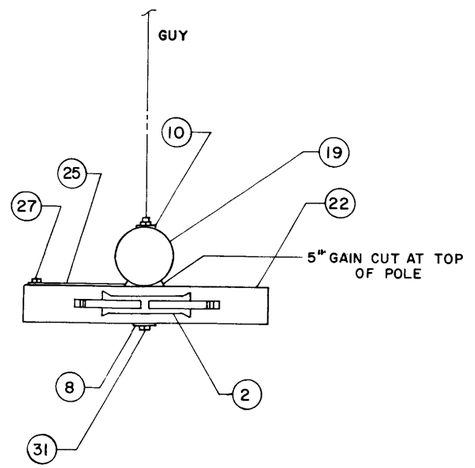
Figure 2-3. Transmission Line Pole Types, Transmitting Central AN/TST-2



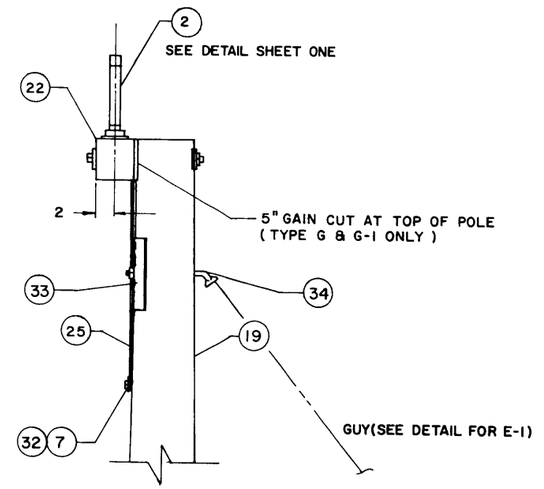


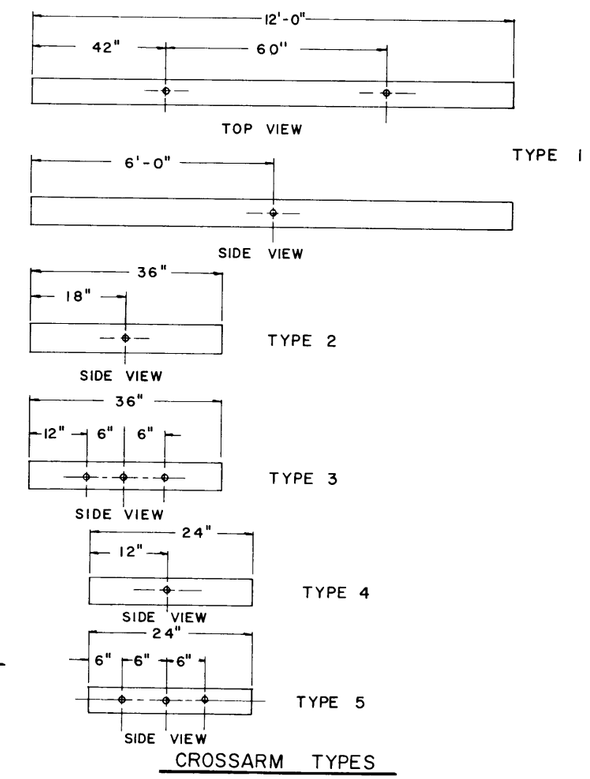
TYPE E-1 POLE





TYPE G POLE(G-1 SHOWN)





CROSSARM TYPES

Figure 2-4. Transmission Line Guying and Crossarms, Transmitting Central AN/TST-2

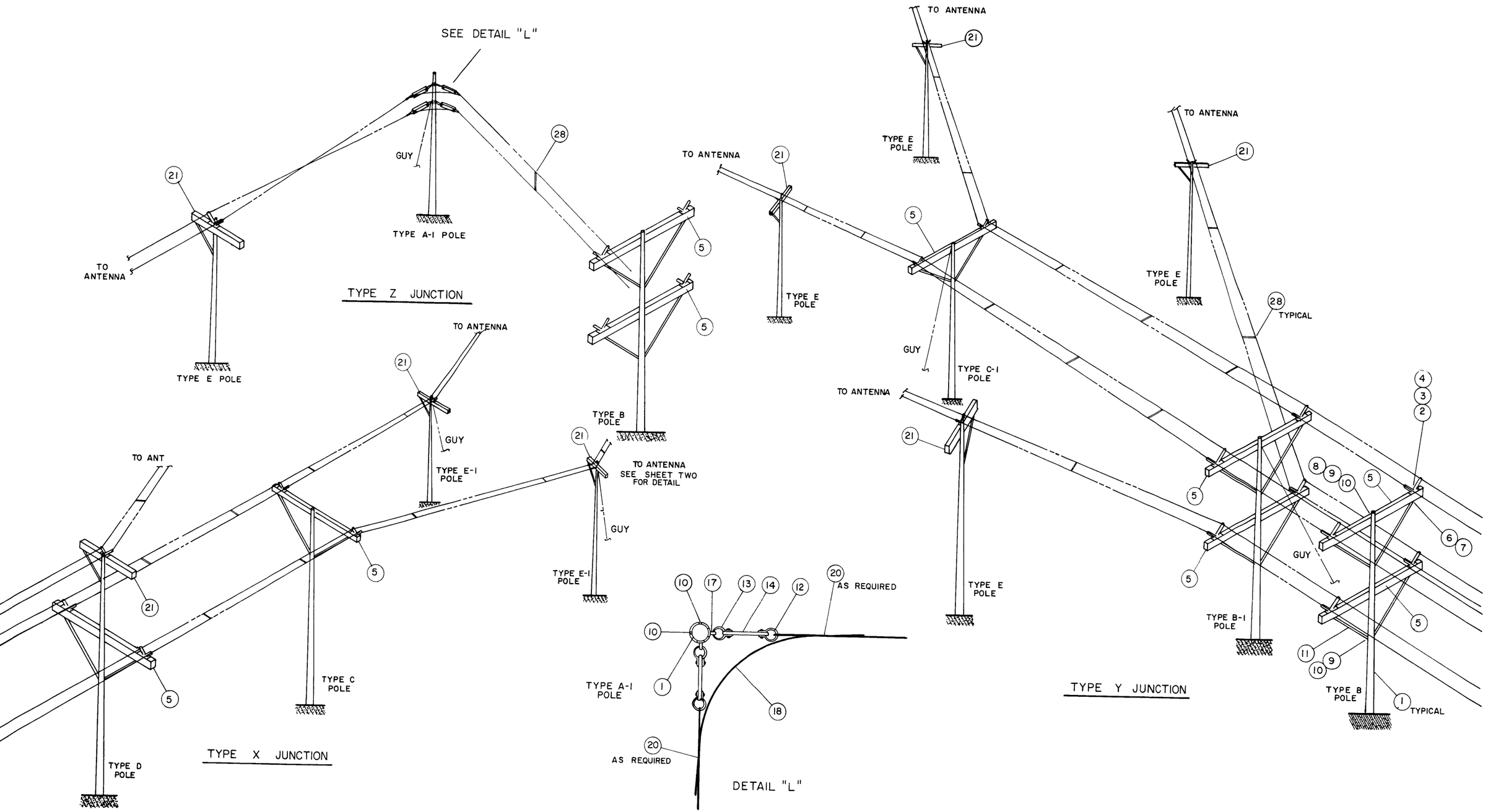


Figure 2-5. Transmission Line Junction Types, Transmitting Central AN/TST-2

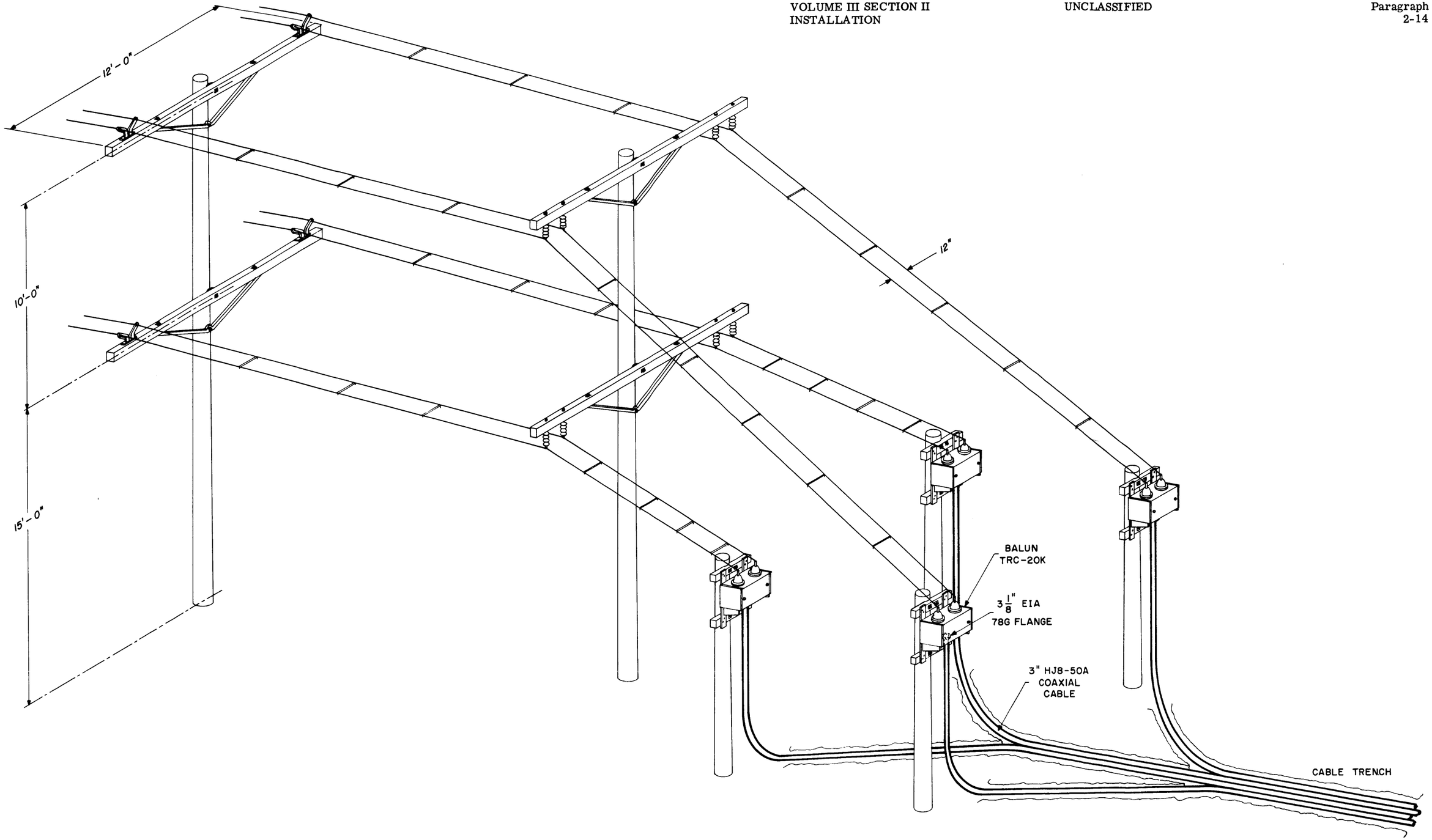


Figure 2-6. Typical Antenna Field Balun Installation, AN/TST-2

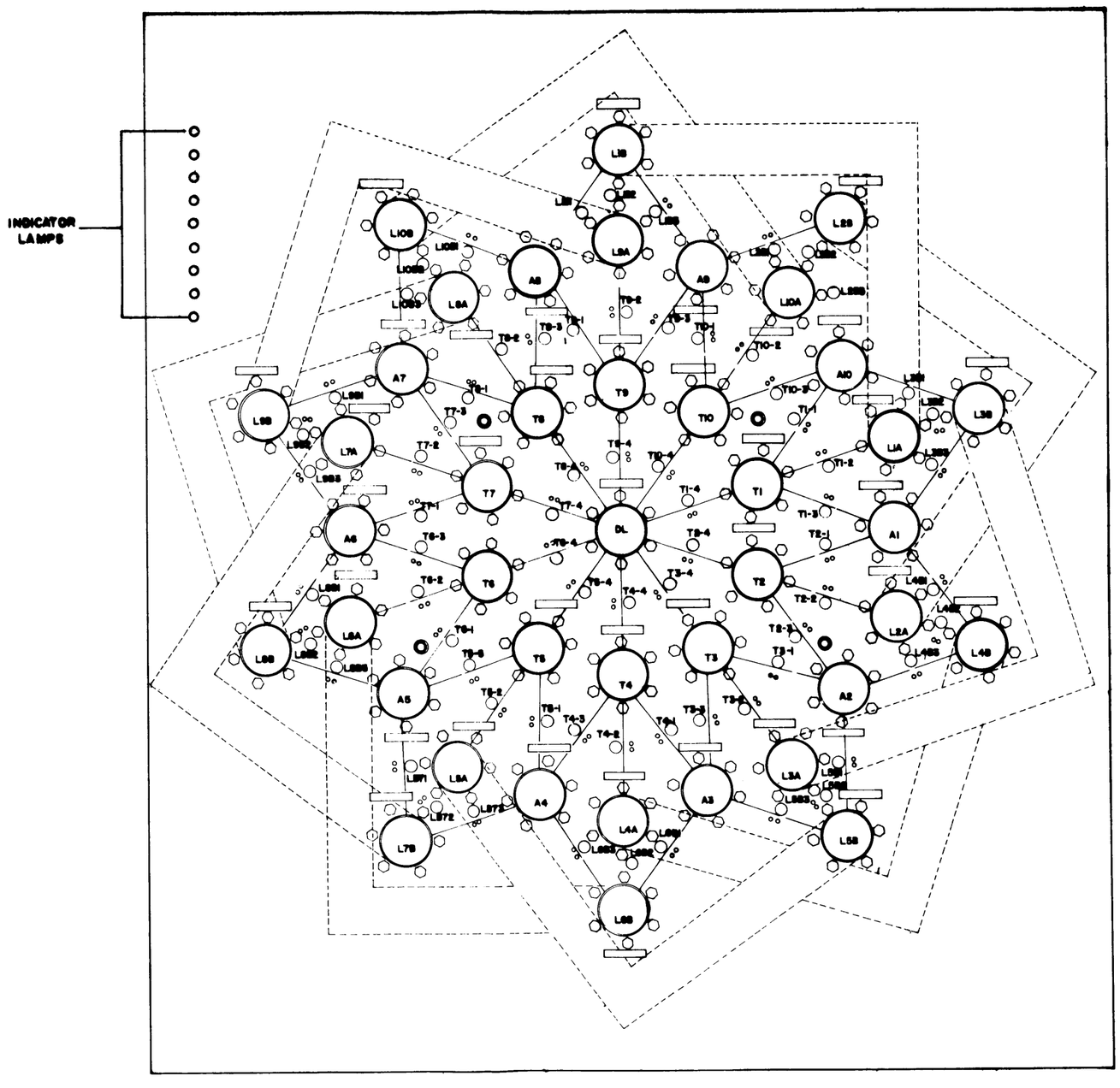
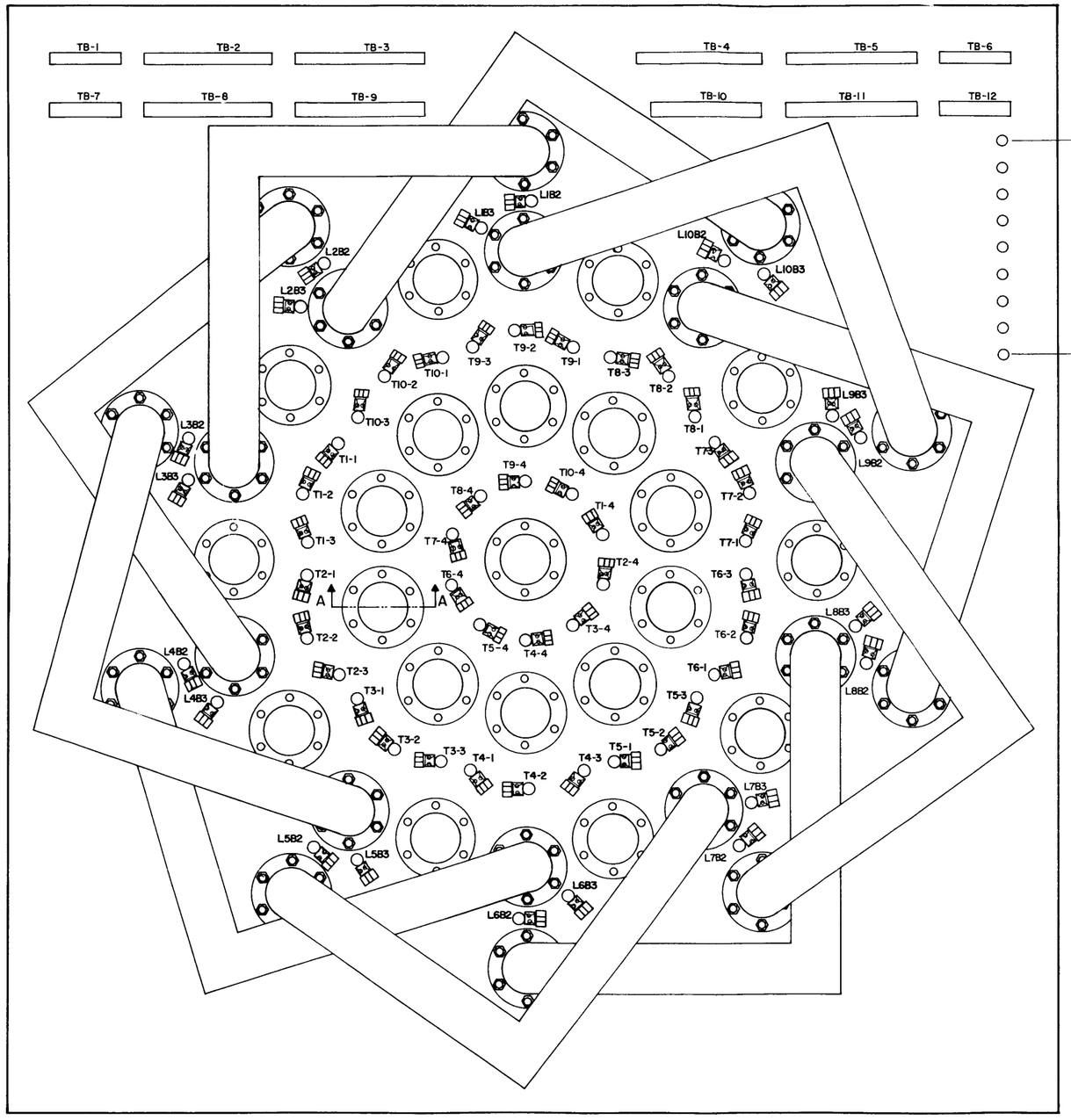
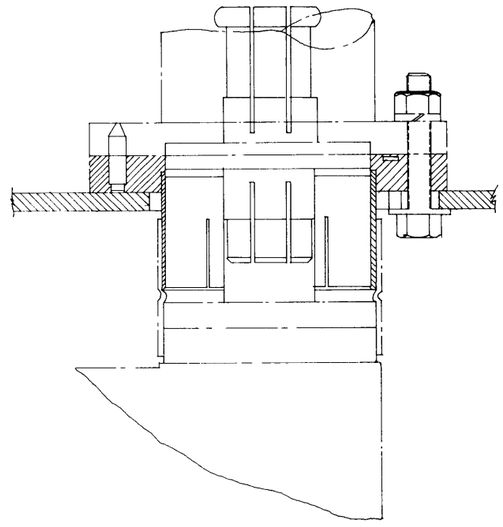


Figure 2-7. Coaxial Patch Panel TD1 and TG1, Front View

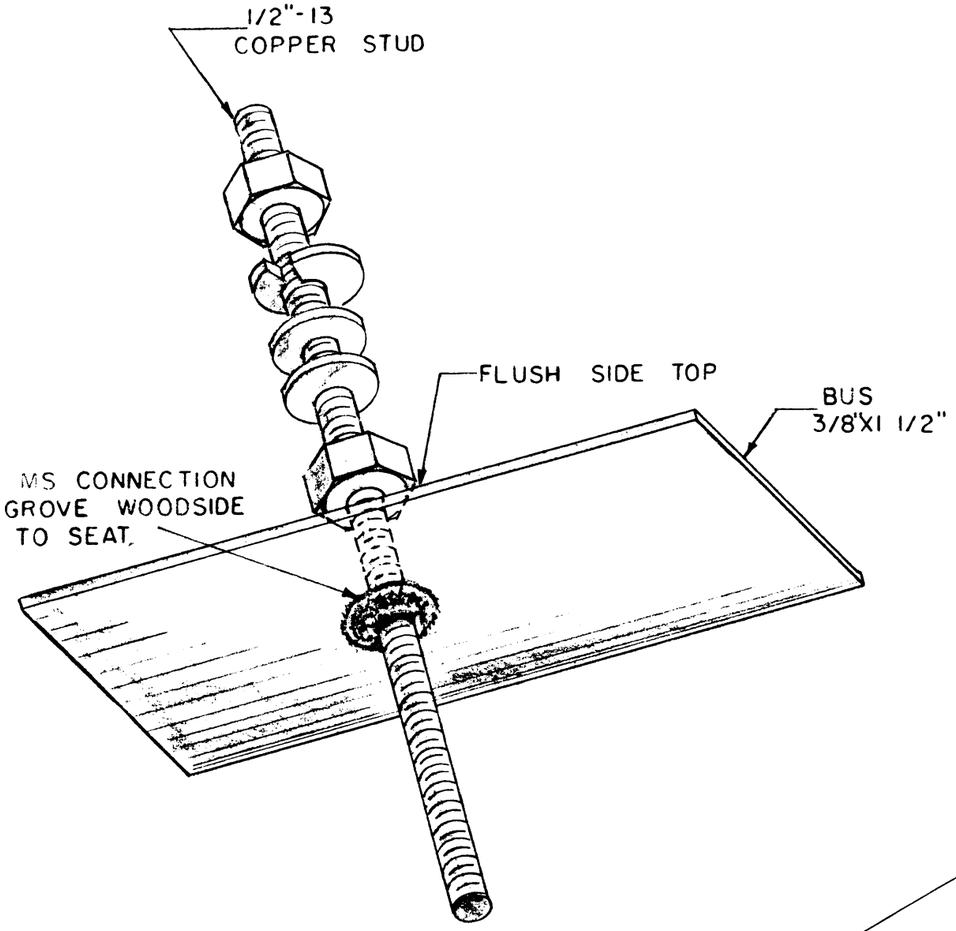


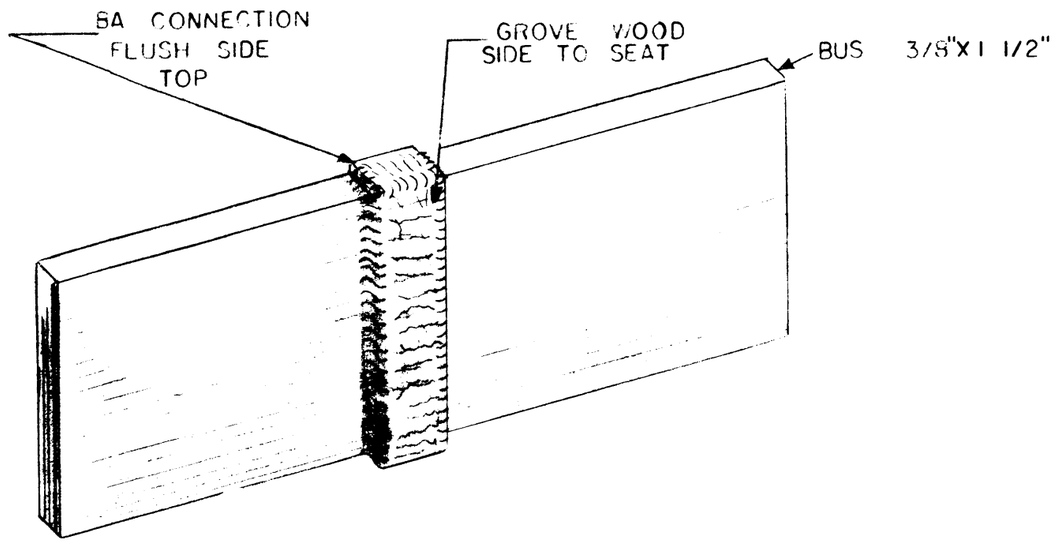
REAR VIEW

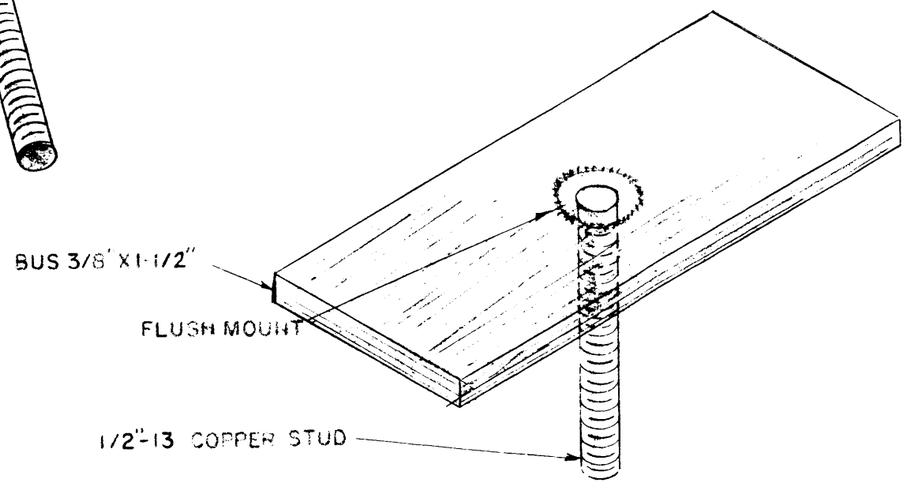


SECTION A-A
(TYPICAL PANEL-U-LINK ASSEMBLY)

Figure 2-8. Coaxial Patch Panel TD1 and TG1, Rear View







STUDS TO BE FIXED IN BUS AT EQUIPMENT GROUNDS.
THREE CONNECTING POINTS FOR GROUND RODS, EACH END AT WOOD DECK END, AND CENTER. WHERE CONNECTING POINT EXTENDED TO OPEN FLOOR, TOP SIDE OF BUS TO BE FLUSH

Figure 2-9. Interior Ground Bus, Transmitting Central AN/TST-2 Containers

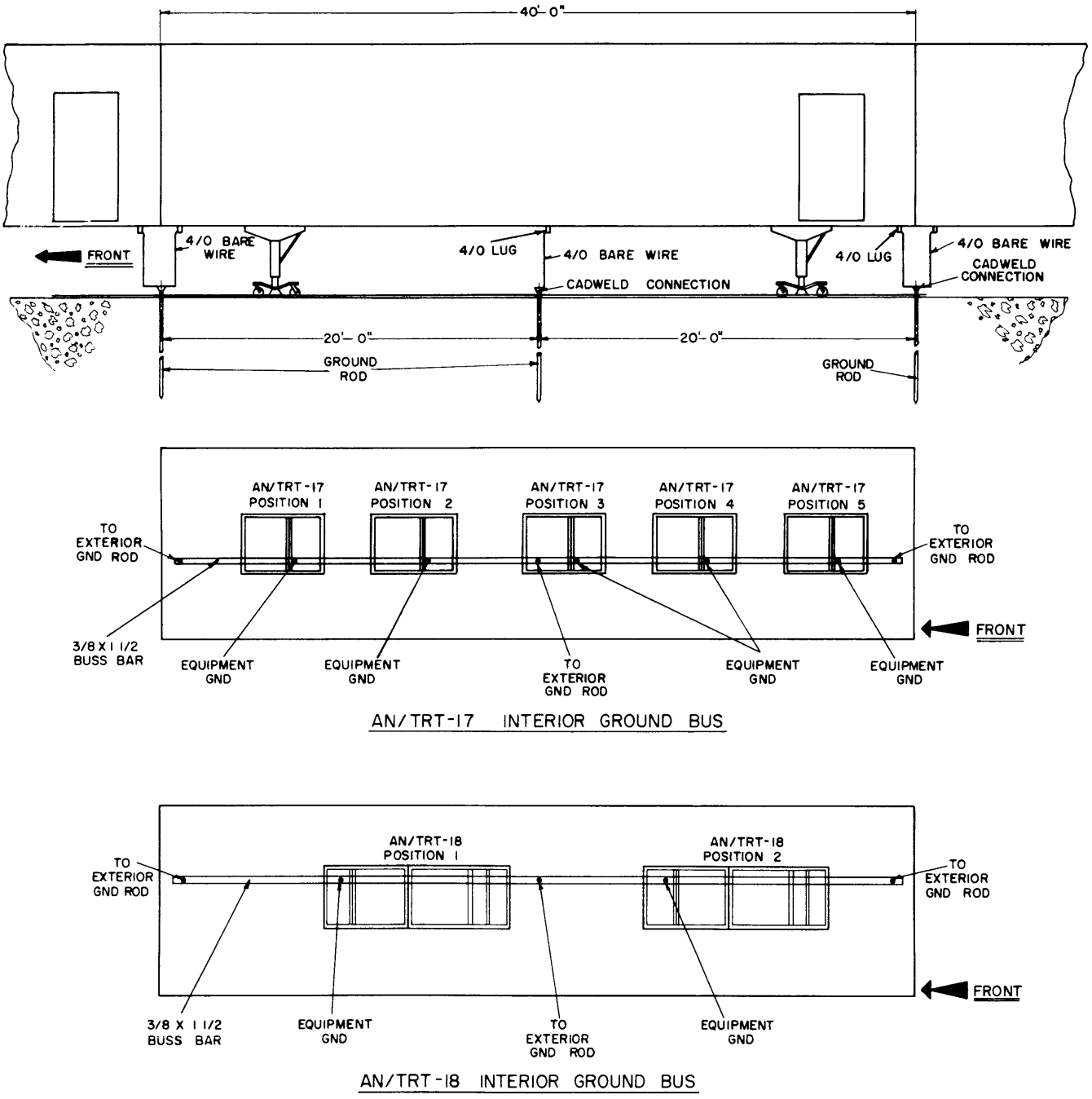
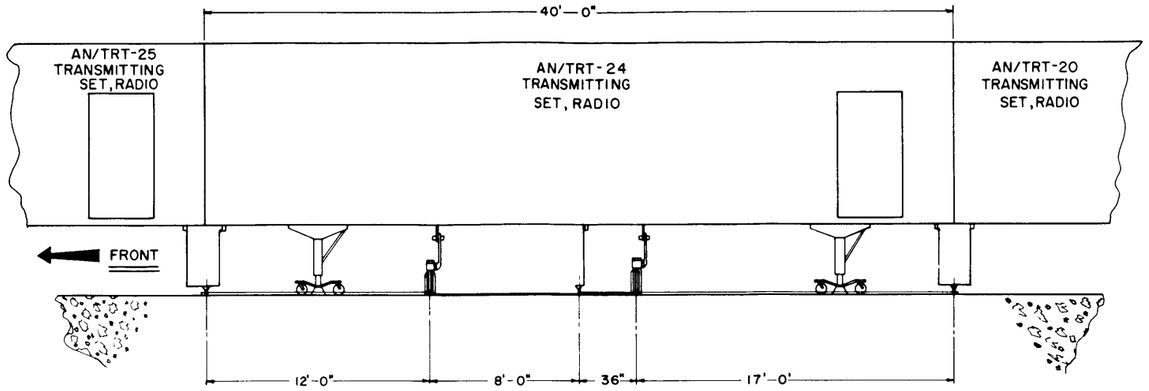
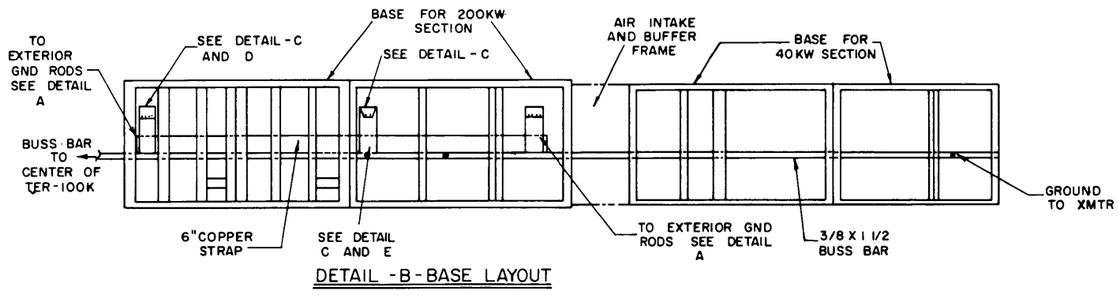


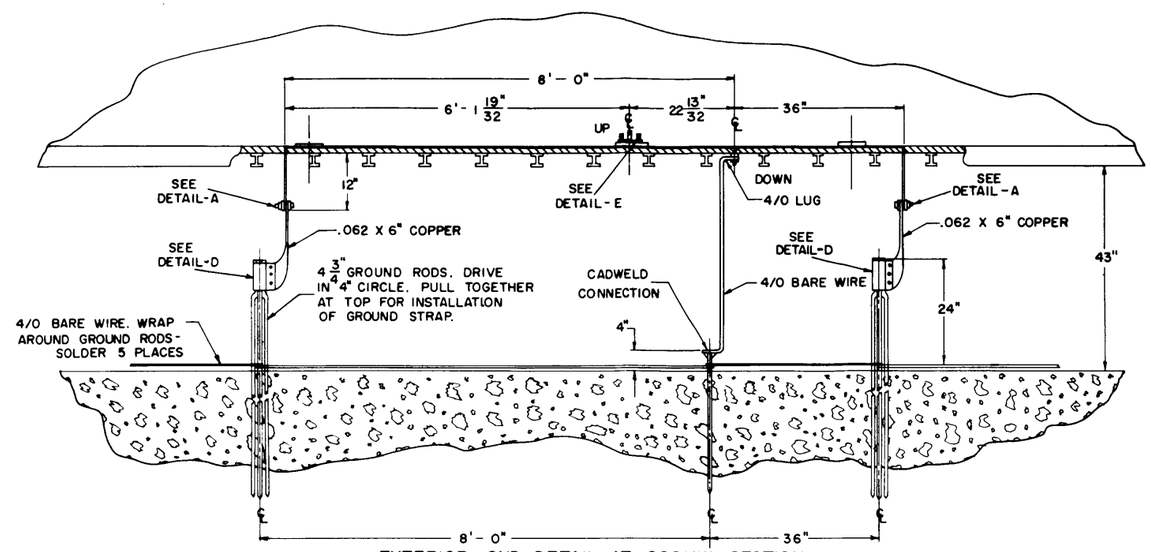
Figure 2-10. Typical Transmitter Container Ground Installation Details

2-15. Power distribution from the main power bus in container GT1 to the transmitter complex is illustrated in figure 2-14. Power feeders to the containers are 4-conductor 4/0 cables from 225-ampere circuit breakers in GT1. Two feeders, each consisting of eight 500MCM cables, are provided for TH3 and TH4. 1000-ampere and 800-ampere circuit breakers are provided for these feeders as shown. A 100-foot cable terminated at both ends with connectors provides power to the mobile workshop trailer when it is at the Transmitting Central. The power cables from GT1 are run into a cable trench that extends to the side of container TG2 where they leave the trench and are run in cable hangers under the containers to their respective containers. The RLPA feeders are run to a power junction box located to the right of container TH1 at the edge of the concrete pad. Individual 2/0 power feeders are then provided for each RLPA antenna from the junction box.



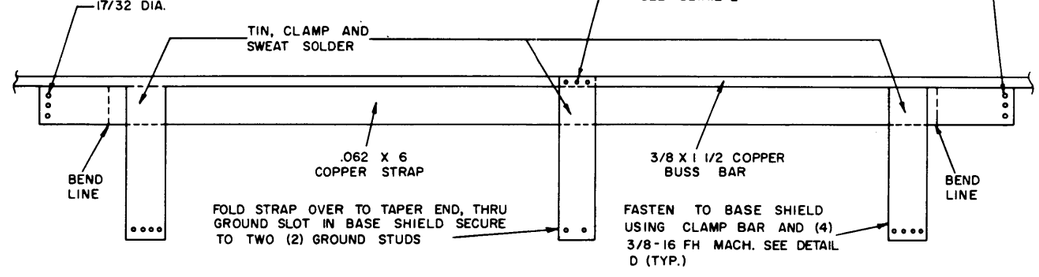


DETAIL - B - BASE LAYOUT

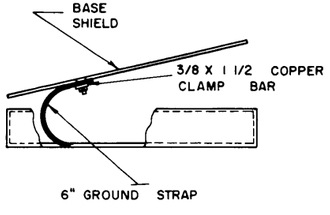


EXTERIOR GND DETAIL AT 200KW SECTION

DETAIL-A

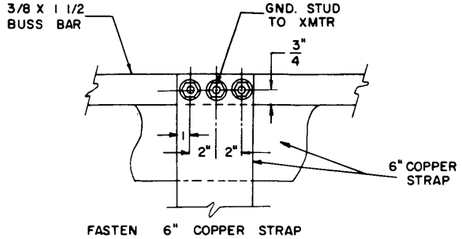


DETAIL - C - COPPER STRAP LAYOUT, TYPICAL



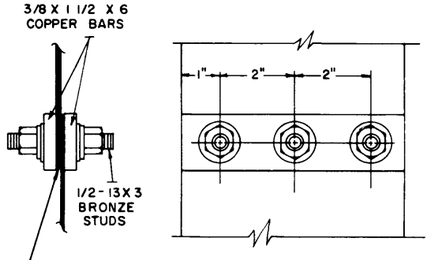
CLEAN ALL MATING SURFACES MAKE CLAMP CONNECTION OF GROUND STRAP AND BASE SHIELD BEFORE INSTALLING BASE SHIELD.

DETAIL - D



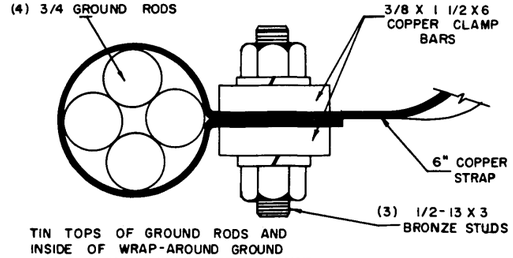
FASTEN 6" COPPER STRAP TO BUSS BAR WITH (3) 1/2-13 BRONZE STUDS AS SHOWN.

DETAIL-E



TIN MATING SURFACES OF COPPER STRAPS BEFORE ASSEMBLY. ASSEMBL WITH CLAMP BARS, HEAT AND TIGHTEN CLAMP WHEN SOLDER FLOWS.

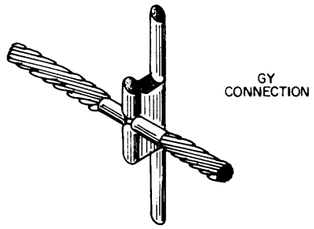
DETAIL - F

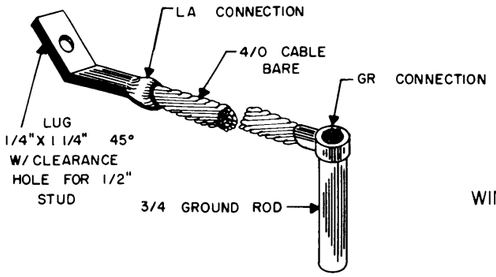


TIN TOPS OF GROUND RODS AND INSIDE OF WRAP-AROUND GROUND STRAP. CLAMP GROUND STRAP AROUND GROUND RODS. PACK BOTTOM OPENINGS WITH SHREDDED ASBESTOS TO FORM RETAINING DAM FOR SOLDER. HEAT WITH TORCH AND ADD SOLDER TO COMPLETELY BOND STRAP AND GROUND RODS.

DETAIL-G

Figure 2-11. AN/TRT-24 Container TH3, Ground Installation Details





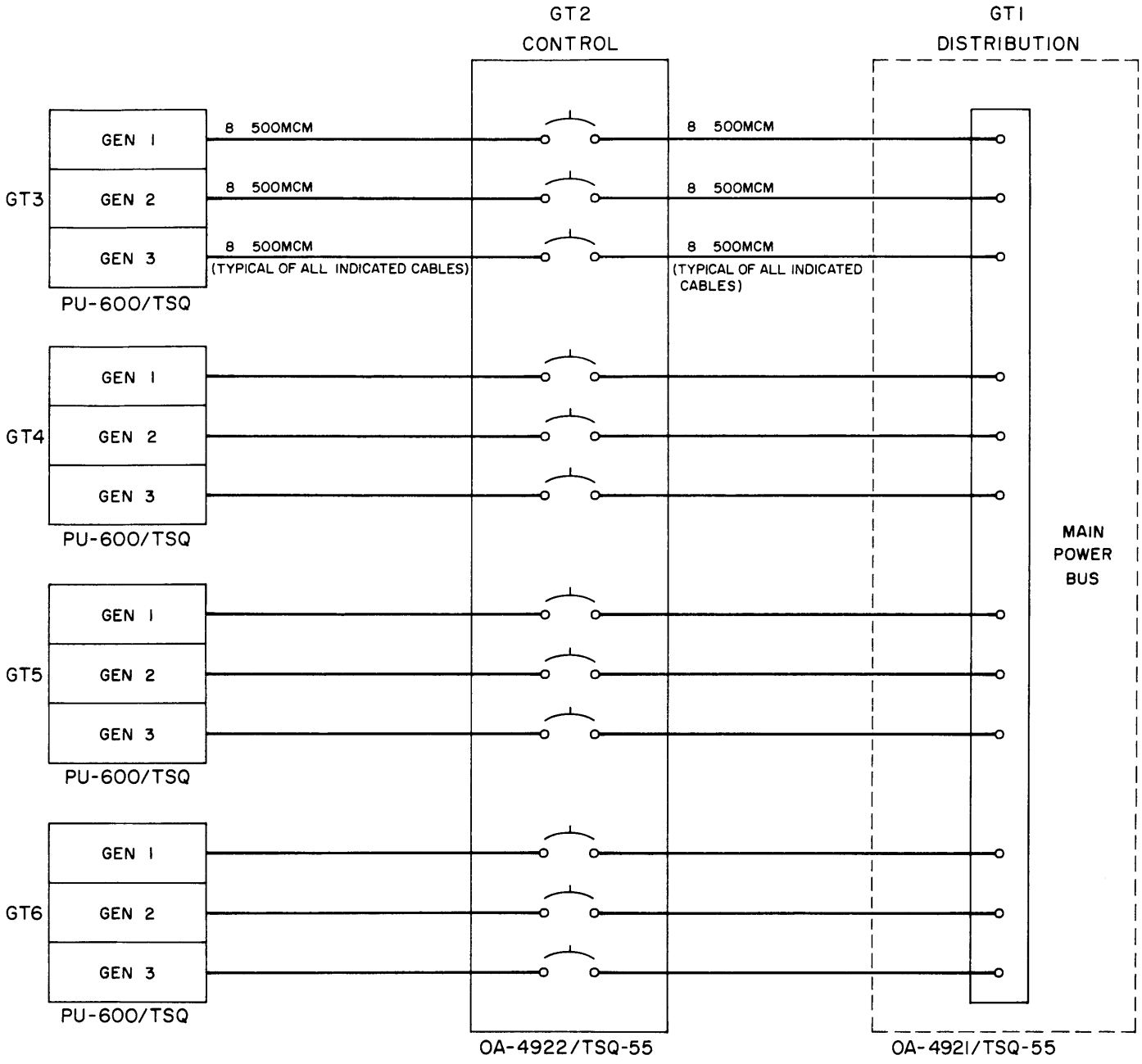
GR CONNECTION W/ 4/0 TIES ARE TO BE MADE AT TIME SHELTERS ARE POSITIONED, 4/0 CABLE TIES CUT TO REQUIRED LENGTH PLUS.

GROUND CONNECTION DETAILS

NOTES:

1. ALL TIES FROM ROD TO ROD ARE NO. 4/0 BARE CABLE ANCHORED TO ROD W/ CADWELD GY CONNECTION, 60 JOINTS.
2. GROUND RODS REQUIRED, INCLUDE 3 FOR HELIX SHELTER.
3. _____ INDICATES NO. 4/0 WIRE, GROUND.
4. GENERATOR SHELTER GROUNDING SPECIFIED SEPERATELY.

Figure 2-12. Ground System, Transmitting Central AN/TST-2



NOTES:

1. ALL CIRCUIT BREAKERS ARE 1600AMP. 3 PHASE. TYPE DB-50.

Figure 2-13. Electric Power Plant AN/TSQ-55, Power Cabling

2-16. Power cabling from distribution panels to equipment in the AN/TRT-17 and AN/TRT-18 transmitter containers is illustrated in figures 2-15 and 2-16. Figure 2-17 illustrates the power and signal cable runs installed in the AN/TRT-24 container, TH3. Figures 2-18 and 2-19 show the power cabling in containers TH4 and TG4, and the power and control cabling between the two containers.

2-17. POWER DISTRIBUTION TABLES.

Tables 2-1 through 2-15 list the function, associated rack or equipment, power phase and current rating of each circuit breaker installed in the power distribution panels of the Transmitting Central containers.

TABLE 2-1. PRIMARY POWER DISTRIBUTION AN/TRT-17 (CONTAINERS TA1, TA2, TG2)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	50	3	AN/FRT-39D
1	2	ALL	50	4	AN/FRT-39D
1	3	ALL	50	5	AN/FRT-39D
1	4	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
1	MAIN	ALL	225		MAIN POWER
2	1	3	15		SPARE
2	2	3	15		SPARE
2	3	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
2	4	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
2	5	2	15	LIGHTS	GROUP A
2	6	ALL	50	1	AN/FRT-39D
2	7	3	15	LIGHTS	GROUP B
2	8	ALL	50	2	AN/FRT-39D
2	MAIN	ALL	225		MAIN POWER

TABLE 2-2. PRIMARY POWER DISTRIBUTION AN/TRT-23 (CONTAINER TA3)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	1	15		SPARE
1	2	1	15		SPARE
1	3	2	15		SPARE
1	4	2	15	LIGHTS	GROUP A
1	5	3	15	LIGHTS	GROUP B
1	6	3	15	TA3.22 TA3.26	UTILITY
1	7	1	30	TA3.26	AN/URT-19(V)
1	8	1	30	TA3.22	AN/URT-19(V)
1	9	2	30	TA3.18	AN/URT-19(V)
1	10	2	30	TA3.14	AN/URT-19(V)

TABLE 2-2. PRIMARY POWER DISTRIBUTION AN/TRT-23 (CONTAINER TA3) (CONT)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	11	3	30	TA3.10	AN/URT-19(V)
1	12	3	15	TA3.10 TA3.14 TA3.18	UTILITY
1	13	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
1	14	ALL	50	TA3.4	AN/FRT-39D
1	MAIN	ALL	225	ALL	MAIN POWER
2	1	1	15		SPARE
2	2	1	15		SPARE
2	3	2	15	TA3.4	UTILITY
2	4	2	15	TA3.25 TA3.29	UTILITY
2	5	3	15	TA3.13 TA3.17 TA3.21	UTILITY
2	6	3	15	TA3.2	UTILITY
2	7	1	30	TA3.25	AN/URT-19(V)
2	8	1	30	TA3.29	AN/URT-19(V)
2	9	2	30	TA3.21	AN/URT-19(V)
2	10	2	30	TA3.17	AN/URT-19(V)
2	11	3	30	TA3.13	AN/URT-19(V)
2	12	3	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
2	13	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
2	14	ALL	50	TA3.4	AN/FRT-39D
2	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-3. PRIMARY POWER DISTRIBUTION AN/TRT-18 (CONTAINERS TB1 & TH1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	225	1	AN/FRT-40B
2	1	ALL	225	2	AN/FRT-40B
3	1	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
3	2	1	15		SPARE
3	3	2	15	1	UTILITY
3	4	2	15	2	UTILITY
3	5	3	15	LIGHTS	GROUP B
3	7	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
3	8	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
3	MAIN	ALL	225		MAIN POWER

TABLE 2-4. PRIMARY POWER DISTRIBUTION AN/TRT-17 (CONTAINERS TB2, TB3, TC4, AND TD4)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	1	15		SPARE
1	2	1	15		SPARE
1	3	2	15		SPARE
1	4	2	15		SPARE
1	5	3	15	.1	UTILITY
1	6	3	15	.2	UTILITY
1	7	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	8	2	20	LIGHTS	GROUP A
1	9	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
1	10	3	15	LIGHTS	GROUP B
1	11	ALL	50	.1	AN/FRT-39D
1	12	ALL	50	.2	AN/FRT-39D
1	MAIN	ALL	225	ALL	

TABLE 2-4. PRIMARY POWER DISTRIBUTION AN/TRT-17 (CONTAINERS TB2, TB3, TC4, AND TD4) (CONT)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
2	1	1	15		SPARE
2	2	1	15		SPARE
2	3	2	15	.3	UTILITY
2	4	2	15		SPARE
2	5	3	15	.4	UTILITY
2	6	3	15	.5	UTILITY
2	7	ALL	50	.5	AN/FRT-39D
2	8	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
2	9	ALL	50	.3	AN/FRT-39D
2	10	ALL	50	.4	AN/FRT-39D

TABLE 2-5. PRIMARY POWER DISTRIBUTION OA-4915/TST-2 (CONTAINER TC1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	3	15	TC1.33	TH-39A/UGT (TIS-3)
1	2	3	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	3	1	15	TC1.13	DC METER
1	4	1	15	TC1.10 TC1.26 TC1.32	UTILITY
1	5	2	15	LIGHTS	GROUP A
1	6	2	15	TC1.32	UHF EQUIPMENT
1	7	3	15	LIGHTS	GROUP B
1	8	3	15	TC1.30	AN/FCC-17
1	9	1	15	TC1.21 TC1.27 TC1.33	UTILITY
1	10	1	15	TC1.28	AN/FCC-17

TABLE 2-5. PRIMARY POWER DISTRIBUTION OA-4915/TST-2 (CONTAINER TC1)(CONT)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	11	2	15	TC1.31	TH-39A/UGT (TIS-3)
1	12	2	15	TC1.26	AN/FCC-17
1	13	3	15	TC1.29	TH-39A/UGT (TIS-3)
1	14	3	15	TC1.22	MICROWAVE EQUIPMENT
1	15	1	15	TC1.27	TH-39A/UGT (TIS-3)
1	16	1	15	TC1.24	MICROWAVE EQUIPMENT
1	17	2	15	TC1.25	TH-39A/UGT (TIS-3)
1	18	2	15	TC1.10	TEST RACK
1	19	3	15	TC1.23	TH-39A/UGT (TIS-3)
1	20	3	15	TC1.8	VLFC
1	21	1	15	TC1.21	TH-39A/UGT (TIS-3)
1	22	1	15	TC1.6	TELETYPE
1	23	2	15	TC1.19	AN/FGC-60
1	24	2	15	TC1.2	UTILITY
1	25	3	15	TC1.17	AN/FGC-60
1	26	3	15	TC1.6 TC1.11	UTILITY
1	27	1	15	TC1.11	TD-410
1	28	ALL	225	AIR CONDITIONER	MAIN POWER
1	29	2	15	TC1.9	MONITOR
1	30	3	15	TC1.7	MONITOR
1	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-6. PRIMARY POWER DISTRIBUTION AN/TRT-18 (CONTAINERS TC2, TC3, TD2, TD3, AND TG3)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	225	1	AN/FRT-40B
2	1	ALL	225	2	AN/FRT-40B
3	1	3	15		SPARE
3	2	3	15		SPARE
3	3	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
3	4	1	15		SPARE
3	5	2	15	1	UTILITY
3	6	2	15	2	UTILITY
3	7	3	15	LIGHTS	GROUP A
3	8	3	15	LIGHTS	GROUP B
3	9	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
3	10	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
3	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-7. PRIMARY POWER DISTRIBUTION OA-4916/TST-2 (CONTAINER TD1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	2	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	2	2	15	DUMMY LOAD	MAIN POWER
1	3	3	15		UTILITY
1	4	3	15		UTILITY
1	5	1	15	DEHYDRATOR	MAIN POWER
1	6	ALL	90	AIR CONDITIONER	MAIN POWER
1	7	2	15	LIGHTS	GROUP A
1	8	3	15	LIGHTS	GROUP B
1	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-8. PRIMARY POWER DISTRIBUTION AN/TRT-19 (CONTAINER TE1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	2	15		SPARE
1	2	2	15		SPARE
1	3	3	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	4	3	15		UTILITY
1	5	1	15		UTILITY
1	6	ALL	100	TE1.1 TE1.2 TE1.3 TE1.4	AN/FRT-19
1	7	2	15	LIGHTS	GROUP A
1	8	3	15	LIGHTS	GROUP B
1	9	ALL	50	TE1.8	TAB-7
1	10	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
1	11	ALL	50	TE1.6	TAB-7
1	12	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
1	MAIN	ALL	225	ALL	MAIN POWER
2	MAIN	ALL	225	STEP-UP XFMR	HELIX CONTAINER MAIN POWER

TABLE 2-9. PRIMARY POWER DISTRIBUTION OA-4917/TST-2 (CONTAINER TF1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	1	15		SPARE
1	2	1	15	LIGHTS	SHOP AREA
1	3	2	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	4	2	15	TF1.1	GRINDER
1	5	3	15	TF1.1	UTILITY
1	6	3	15	TF1.1	BENCH

TABLE 2-9. PRIMARY POWER DISTRIBUTION OA-4917/TST-2 (CONTAINER TF1) (CONT)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	7	1	15	TF1.1	DRILL PRESS
1	8	1	15	TF1.1	BENCH
1	9	2	15	TF1.4	UTILITY
1	10	2	15	TF1.1	BENCH
1	11	3	15	TF1.4	DESK
1	12	3	15	TF1.1	BENCH
1	13	1	15	LIGHTS	STORAGE AREA
1	14	ALL	90	AIR CONDITIONER	MAIN POWER
1	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-10. PRIMARY POWER DISTRIBUTION OA-4918/TST-2 (CONTAINER TG1)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	2	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	2	2	15	DUMMY LOAD	MAIN POWER
1	3	3	15		UTILITY
1	4	3	15		UTILITY
1	5	1	15	DEHYDRATOR	MAIN POWER
1	6	ALL	90	AIR CONDITIONER	MAIN POWER
1	7	2	15	LIGHTS	GROUP A
1	8	3	15	LIGHTS	GROUP B
1	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-11. PRIMARY POWER DISTRIBUTION AN/TRT-25 (CONTAINER TG4)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	3	15	LIGHTS	GROUP A
1	2	3	15		SPARE
1	3	1	15	LIGHTS	GROUP B
1	4	1	15		SPARE
1	5	2	15	LIGHTS	SHOP GROUP
1	6	2	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
1	7	3	15		UTILITY
1	8	ALL	90	AIR CONDITIONER	MAIN POWER
1	9	2	15		UTILITY
1	11	1	15	SHOP AREA	MAIN POWER
1	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-12. PRIMARY POWER DISTRIBUTION AN/TRT-20 (CONTAINER TH2)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	225	1	AN/FRT-40B
2	1	ALL	225	2	AN/FRT-40B
3	1	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
3	2	1	15		SPARE
3	3	2	15	1	UTILITY
3	4	2	15	2	UTILITY
3	5	3	15	LIGHTS	GROUP B
3	7	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
3	8	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
3	MAIN	ALL	225		MAIN POWER

TABLE 2-13. PRIMARY POWER DISTRIBUTION AN/TRT-24 (CONTAINER TH3)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	225	40 KW SECTION AN/FRT-62	MAIN POWER
2	1	ALL	1000	200 KW SECTION AN/FRT-62	MAIN POWER
3	1	1	15		UTILITY
3	2	1	15	DEHYDRATOR	A/C INPUT
3	3	2	15		UTILITY
3	4	2	15		UTILITY
3	5	3	15	LIGHTS	GROUP A
3	6	3	15	DUMMY LOAD	A/C INPUT
3	7	1	15	LIGHTS	GROUP B
3	8	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
3	9	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
3	10	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
3	MAIN	ALL	225		MAIN POWER

TABLE 2-14. PRIMARY POWER DISTRIBUTION AN/TRT-25 (CONTAINER TH4)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	ALL	800	POWER TRANS-FORMER	MAIN POWER
2	1	2	15		SPARE
2	2	2	15	TH4.1	SBG-1L
2	3	3	15	LIGHTS	GROUP A
2	4	3	15	LIGHTS	GROUP B
2	5	ALL	90	AIR CONDITIONER (FORWARD)	MAIN POWER
2	6	1	15	AIR CONDITIONER CONTROL UNIT	A/C CONTROL
2	7	ALL	90	AIR CONDITIONER (CENTER)	MAIN POWER

TABLE 2-14. PRIMARY POWER DISTRIBUTION AN/TRT-25 (CONTAINER TH4) (CONT)

PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
2	8	2	15		UTILITY
2	10	3	15		UTILITY
2	12	ALL	90	AIR CONDITIONER (AFT)	MAIN POWER
2	MAIN	ALL	225	ALL	MAIN POWER

TABLE 2-15. PRIMARY POWER DISTRIBUTION OA-4940 (HELIX CONTAINER)

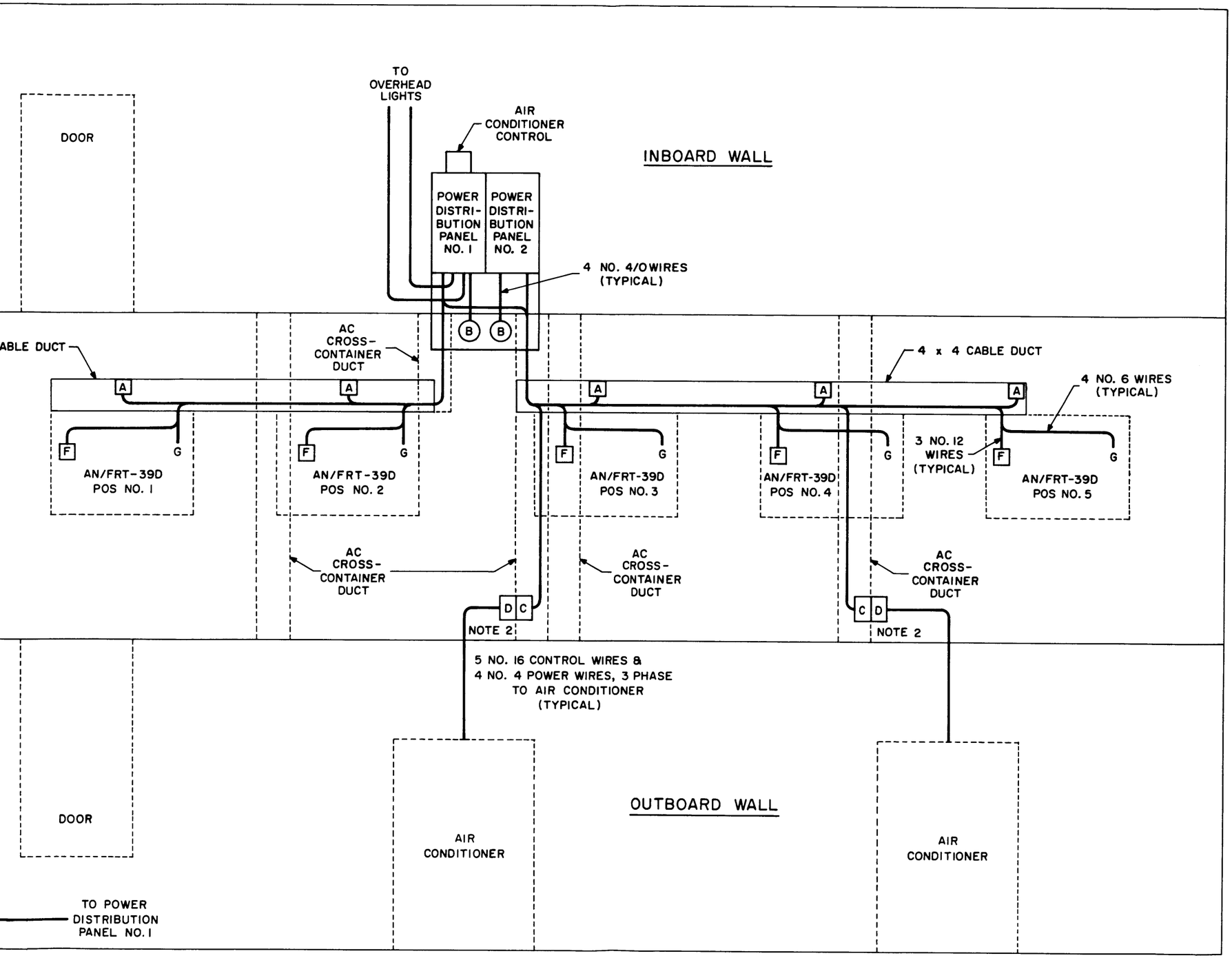
PANEL NUMBER	BREAKER NUMBER	PHASE	CURRENT RATING	ASSOCIATED RACK OR EQUIPMENT	FUNCTION
1	1	1	15		SPARE
1	2	1	15		SPARE
1	3	2	15		UTILITY
1	4	2	15		SPARE
1	5	3	15	LIGHTS	GROUP A
1	6	3	40		SPARE
1	7	ALL	30A	TOWER	LIGHTS
1	8	ALL	30A	CONTROL PANEL	HELIX
1	MAIN	ALL	225		MAIN POWER

NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL CIRCUIT BREAKERS ARE 225-AMP.
2. UNLESS OTHERWISE SPECIFIED, ALL CABLES ARE 4-CONDUCTOR, 4/0, TYPE RHW.

TA3 TB3
TA2 TB2
TA1 TB1
8 500MCM 800 AMP
8 500MCM 1,000AMP
TH4 TH3 TH2 TH1 TC1 TC2 TC3 TC4
TG4 TG3 TG2 TG1 TD1 TD2 TD3 TD4
TF1 TE1
TO MOBILE WORKSHOP TRAILER
TO DIESEL HEATING CIRCUIT
RLPA FEEDERS TO ANT. FIELD TWO NO. 2/0 EACH FEEDER
SPARE CIRCUIT BREAKERS
96 500MCM FROM GT2-CONTROL
1000AMP
800AMP
70AMP
MAIN POWER BUS
CONTAINER GT1 POWER DISTRIBUTION

Figure 2-14. Power Distribution From GT1, Transmitting Central AN/TST-2



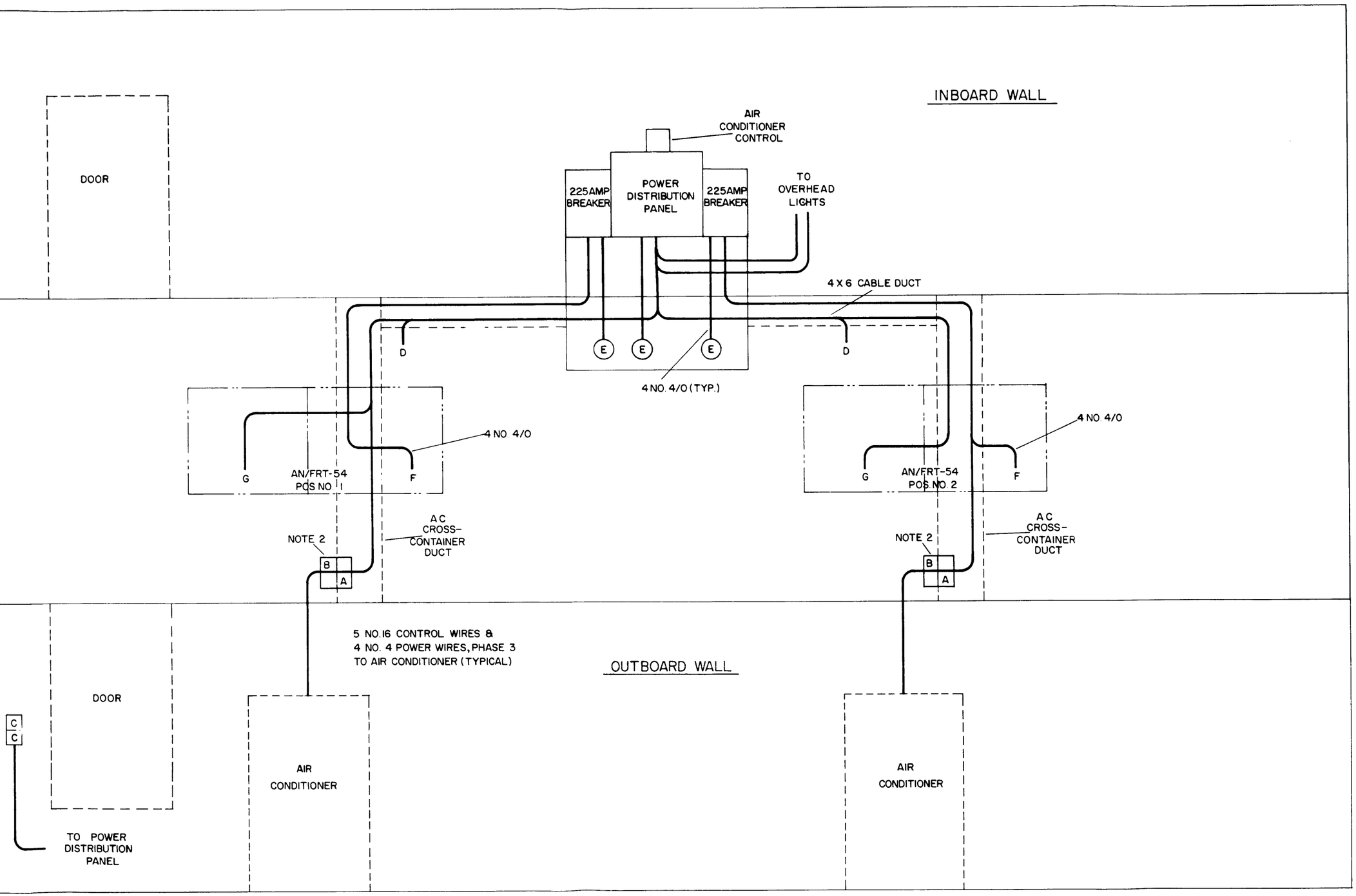
LEGEND:

- A — AC DUPLEX UTILITY OUTLET MOUNTED ON DUCT.
- B — MAIN POWER INPUT FEED THRU.
- C — RECEPTACLE, AIR CONDITIONER.
- D — PLUG, MATING, AIR CONDITIONER.
- E — LIGHT SWITCH.
- F — TRANSMITTER UTILITY POWER.
- G — TRANSMITTER POWER.

NOTES:

1. ALL WIRING, EXCEPT AS INDICATED, IS 3-WIRE, NO. 12, STRANDED.
2. AIR CONDITIONER RECEPTACLE MOUNTED TO SIDE OF CROSS-CONTAINER DUCT.

Figure 2-15. Typical AN/TRT-17 Power Cabling



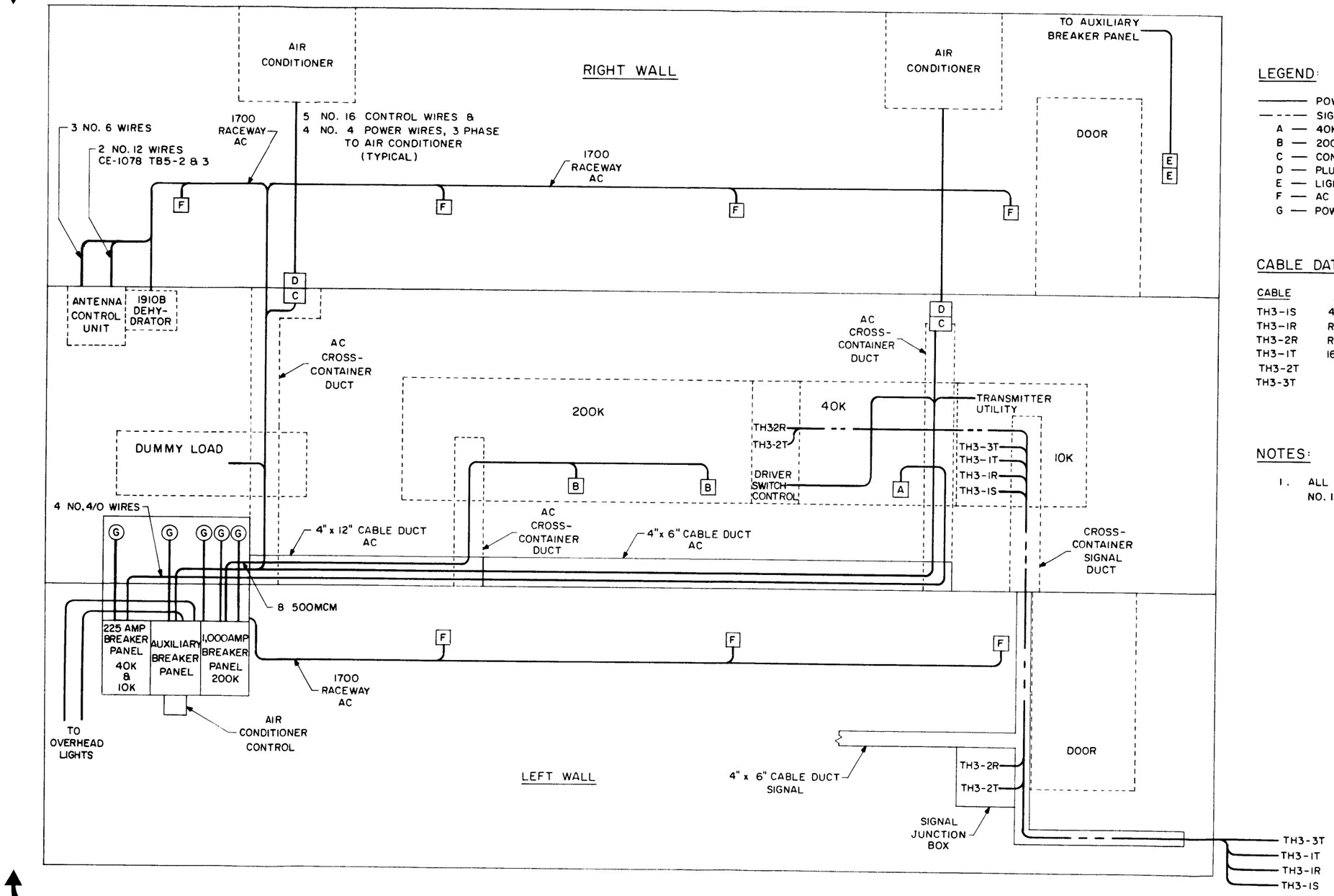
LEGEND:

- A – RECEPTACLE, AIR CONDITIONER
- B – PLUG, MATING, AIR CONDITIONER
- C – LIGHT SWITCH
- D – A C DUPLEX UTILITY OUTLET MOUNTED ON TOP OF CABLE DUCT
- E – MAIN POWER INPUT FEED THRU
- F – TRANSMITTER POWER
- G – TRANSMITTER UTILITY POWER

GENERAL NOTES

1. ALL WIRING, EXCEPT AS INDICATED, IS 3 WIRE, NO.12 STRANDED.
2. AIR CONDITIONER RECEPTACLE MOUNTED TO SIDE OF AC CROSS-CONTAINER DUCT.

Figure 2-16. Typical AN/TRT-18 Power Cabling



LEGEND:

——— POWER.
— - - — SIGNAL.
A — 40K, 3φ, AC POWER SUPPLY.
B — 200K, 3φ, AC POWER SUPPLY.
C — CONNECTOR, AIR CONDITIONER.
D — PLUG, MATING, AIR CONDITIONER.
E — LIGHT SWITCH.
F — AC DUPLEX UTILITY OUTLET.
G — POWER INPUT FEED THRU.

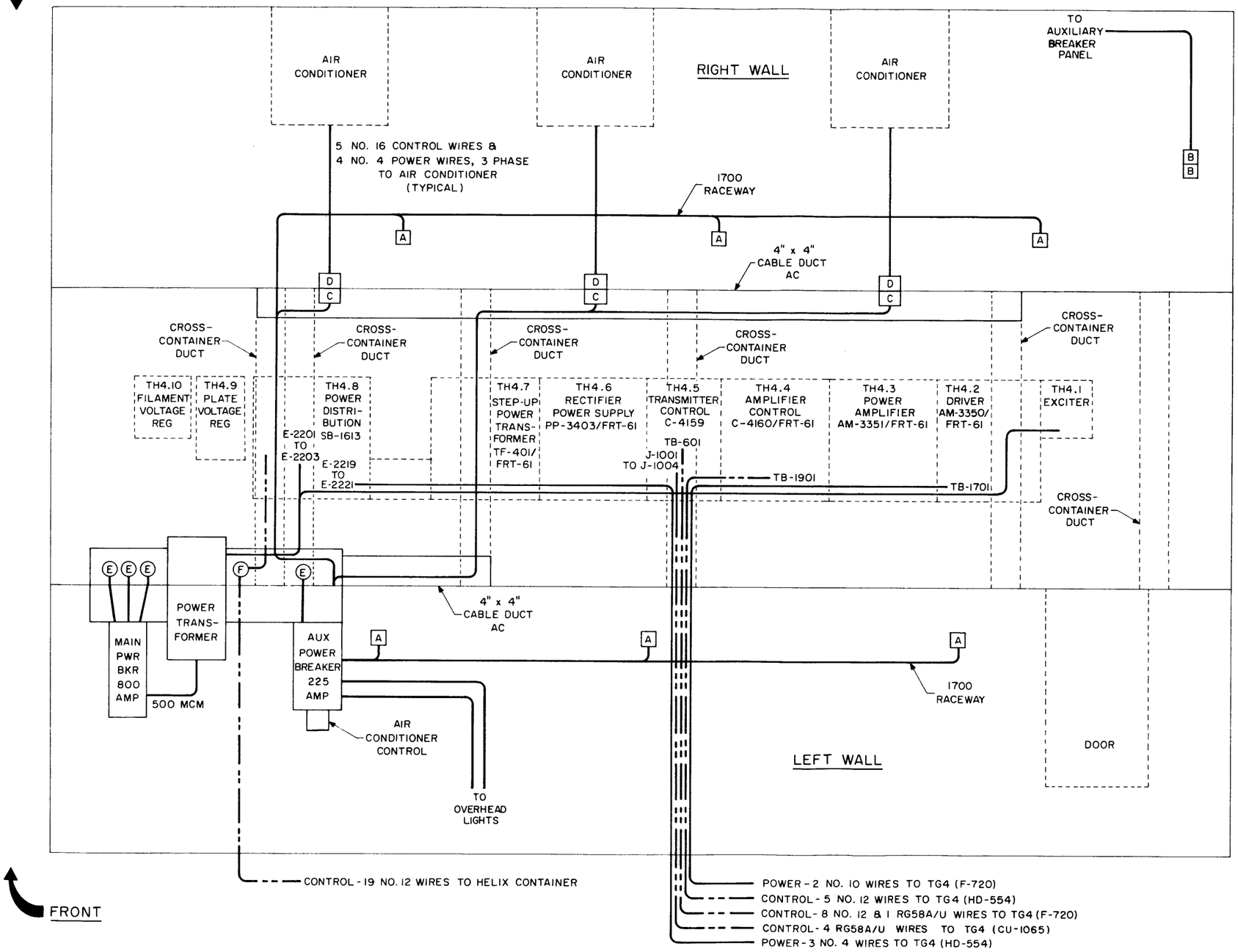
CABLE DATA:

CABLE	TYPE	USE
TH3-IS	4PRTMC	SIGNAL TO 40K EXCITER
TH3-IR	RG-58	RF MONITOR
TH3-2R	RG-58	REMOTE 40K ALDC
TH3-IT	1645JTO	40K REM. RAD. IND. & INT.
TH3-2T	"	REM. 40K READY & INT.
TH3-3T	"	200K REM. RAD. IND.

NOTES:

1. ALL WIRING, EXCEPT AS INDICATED, IS 3-WIRE, NO. 12, STRANDED.

Figure 2-17. AN/TRT-24 Power and Signal Cabling



LEGEND:

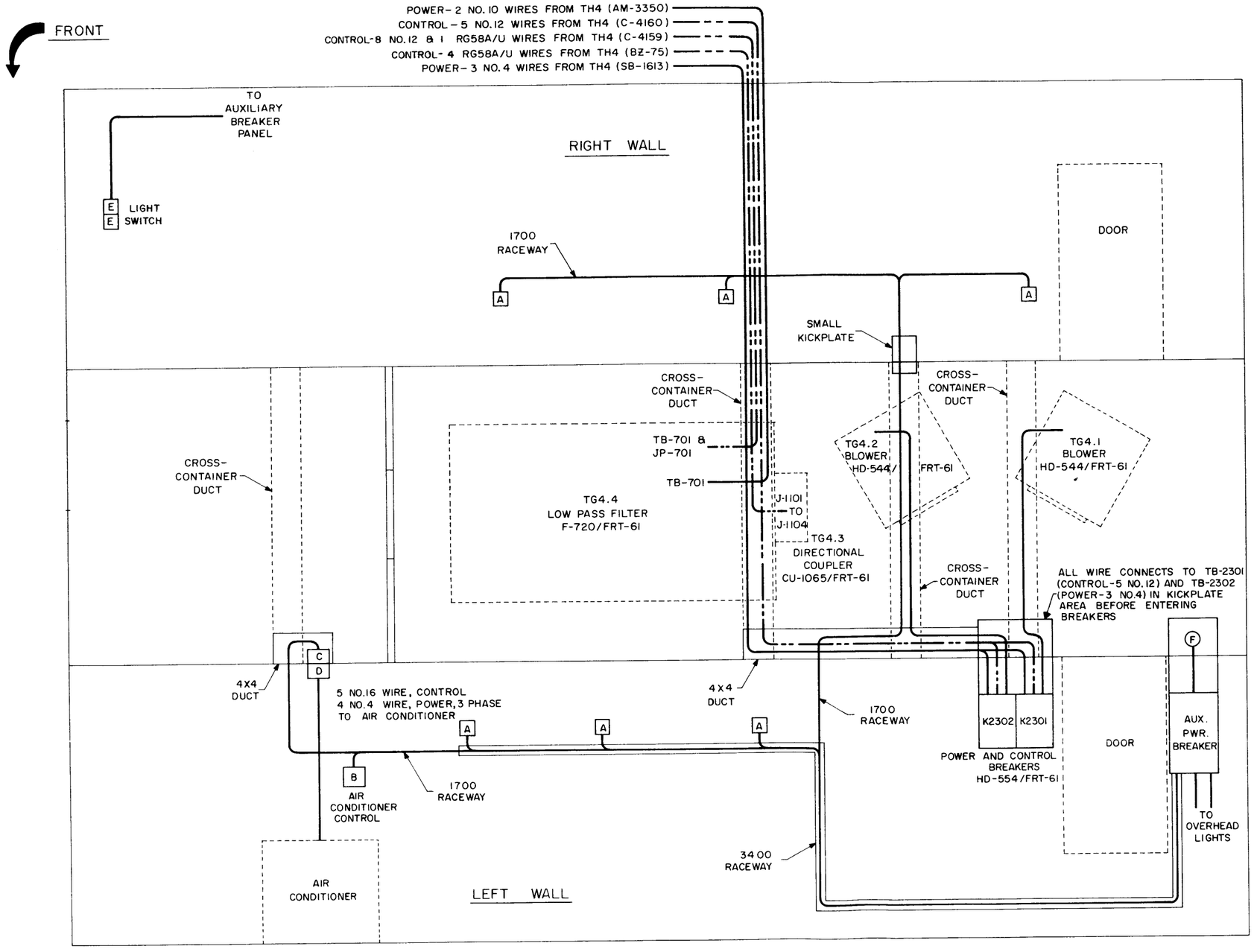
POWER.
CONTROL.

A — AC DUPLEX UTILITY OUTLET.
B — LIGHT SWITCH.
C — CONNECTOR, AIR CONDITIONER.
D — PLUG, MATING, AIR CONDITIONER.
E — POWER INPUT FEED THRU.
F — CONTROL OUTPUT FEED THRU.

NOTES:

1. ALL WIRING, EXCEPT AS INDICATED, IS 3-WIRE, NO. 12, STRANDED.

Figure 2-18. AN/TRT-25 Power and Control Cabling, Container TH4



LEGEND:

A — AC DUPLEX UTILITY OUTLET
B — AIR CONDITIONER CONTROL
C — CONNECTOR, AIR CONDITIONER
D — PLUG, MATING, AIR CONDITIONER
E — LIGHT SWITCH
F — POWER INPUT FEED THRU
———— POWER
– – – – CONTROL (OR SIGNAL)

GENERAL NOTES:

1 — ALL WIRING, EXCEPT AS INDICATED, IS 3-WIRE, NO.12, STRANDED.

Figure 2-19. AN/TRT-25 Power and Control Cabling, Container TG4

SECTION III
DESCRIPTION OF SPECIAL CIRCUITS AND MODIFICATIONS

3-1. INTRODUCTION.

This section contains a description of the transmitter control, alarm, monitor and interlock circuits at Transmitting Central AN/TST-2 and a description of electrical modifications to the high frequency transmitters. Block diagrams of typical transmitter circuits are included at the end of this section.

3-2. GENERAL.

All communication between the Transmitting Central and the Receiving Central is by means of a microwave system that provides sixty 3-kc bandwidth receive channels from the receiver site, and twenty-four 3-kc bandwidth send channels to the receiver site. This equipment is installed in the transmitter control container TC1 with the send and receive channels terminated at the audio MDF. All signals from container TC1 to transmitters within the site are on an audio level except push-to-talk transmitter control which is 60-ma DC. The audio signals may be voice, composite tone output of an AN/FGC-60(V) telegraph terminal, or the audio output of the TH-39A/UGT (TIS) units.

3-3. The TH-39A/UGT units of all high-frequency transmitters, normally mounted in the exciter frame, have been removed from the transmitters and relocated in the transmitter control container TC1. The DC input circuits of the TH-39A/UGT units are wired to the DC MDF in position TC1.15 and the audio outputs of the units are wired to the audio MDF in position TC1.5. The TH-39A/UGT units may be patched to any transmitter exciter. The transmitter interlock and radiation indicator circuits are extended to the RF distribution containers TD1 and TG1. The radiation indicator circuits are then extended from TD1 and TG1 to control container TC1 in order to operate transmitter alarm circuits. The frequency amplifier (CHG) units of all high-frequency transmitters have been modified to provide push-to-talk keying from a remote location. The RF Monitor signal from each transmitter is fed back to container TC1 for the purpose of monitoring or measuring transmitter RF frequencies. Figure 3-1 is a simplified schematic diagram that illustrates typical transmitter indicator, alarm, input, control, and monitor circuits between transmitters and the transmitter control and RF distribution containers.

3-4. TRANSMITTER INPUT AND CONTROL CIRCUITS.

Inputs to all transmitters from the Receiving Central are through the microwave system and terminal equipment in control container TC1 as illustrated in the center portion of figure 3-1. Two 3-kc audio channels may be multiplexed by a TD-410/UGC to produce a 6-kc bandwidth signal that is fed to one of the two channel inputs of a sideband exciter (SBE). A RATT or CW signal is fed to an AN/FGC-60(V) telegraph terminal and converted to DC which keys a TH-39A/UGT. The RATT output signal of the TH-39A/UGT is a frequency-shift audio signal which modulates the transmitter. For CW operation, the TH-39A/UGT provides an on-off 1000-cycle tone that modulates the transmitter. A voice signal may be fed directly to a channel of the single sideband transmitter from an AN/FCC-17 VF channel.

3-5. The push-to-talk control signal is applied to an AN/FGC-60(V) terminal which provides a 60-ma DC signal that keys a relay in the frequency amplifier (CHG) unit of the transmitter. The coil of the relay is wired to the DC MDF where it is patched to the AN/FGC-60(V) channel. The contacts of the relay are connected in series with the B+ circuit of the frequency amplifier, keying the carrier on and off in response to the push-to-talk signal. This relay has been added to the frequency amplifier units of all the high frequency transmitters, and is used in place of the EXTERNAL KEY input circuit on E303 of the CMO unit in the exciter frame.

3-6. The AN/GRT-3 UHF transmitter in container TC1 is modified for remote push-to-talk operation by the following wiring change made on TBE501 in the MD-141A/GR unit. The lead from "CTR" of TBE501 has been removed from terminal 4 of T-301 and connected to terminal 2 of T-301.

3-7. RADIATION INDICATOR AND TRANSMITTER ALARM CIRCUITS.

The radiation indicator and transmitter alarm circuits are illustrated in figure 3-2. Visual indication that high voltage is applied to a high-frequency transmitter is provided by a red indicator lamp mounted on the top of each AN/FRT-39D, AN/FRT-40B and AN/FRT-62 transmitter, and by the FINAL VOLTAGE indicator on the front of each AN/URT-19(V) transmitter. The indicator lamp is connected across the primary power input to the high voltage rectifier of the transmitter. A step-down transformer (T1), connected in parallel with the transmitter high-voltage indicator lamp, furnishes 12 volts to light a radiation indicator lamp on the front of a coaxial patch panel. The step-down transformer was added to each transmitter and is wired as shown in the figure. Two radiation indicator circuits are extended to the transmitter alarm panel in container TC1 from the AN/FRT-62 transmitter, one from the 200-kw section and the other from the 40-kw section. The radiation indicators of the low-frequency transmitters are not extended to coaxial patch panels since these transmitters are not equipped for unbalanced feed to the antennas. The 12-volt alarm circuits of the low-frequency transmitters are wired directly to the transmitter alarm panels in TC1.

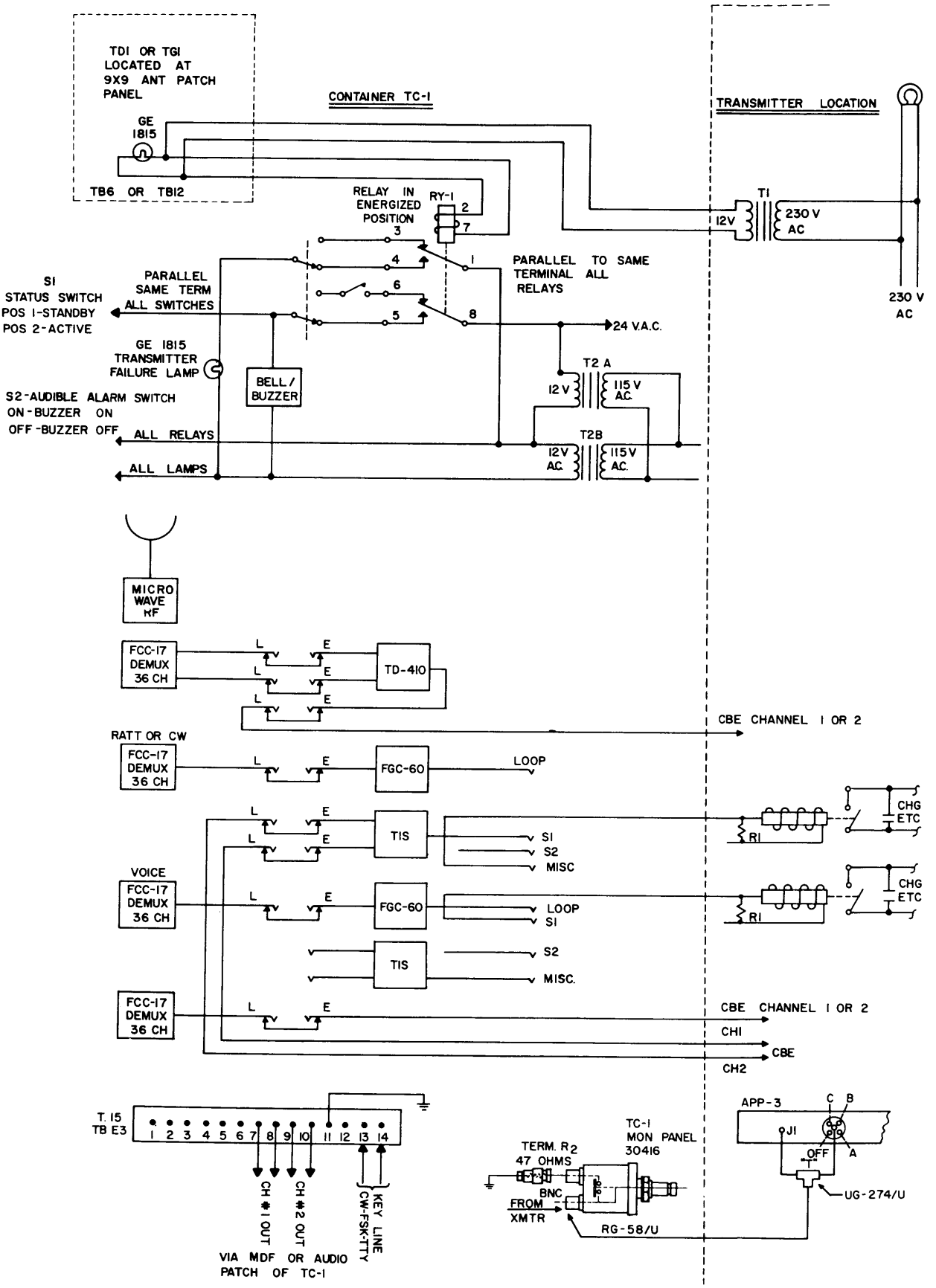
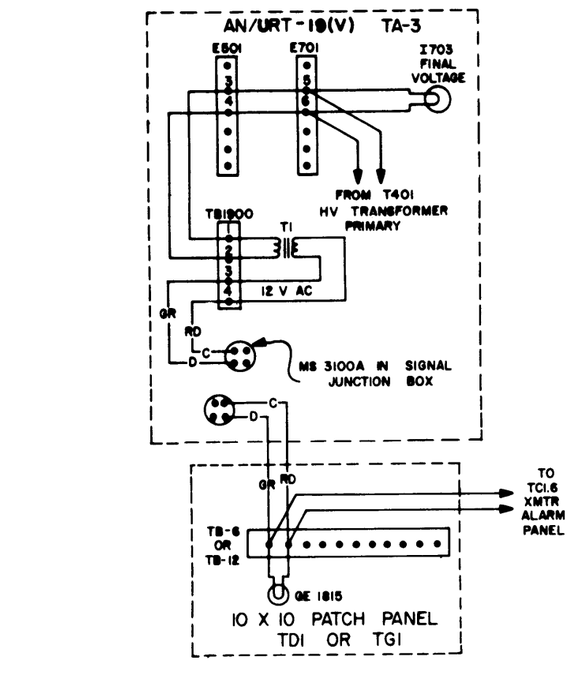
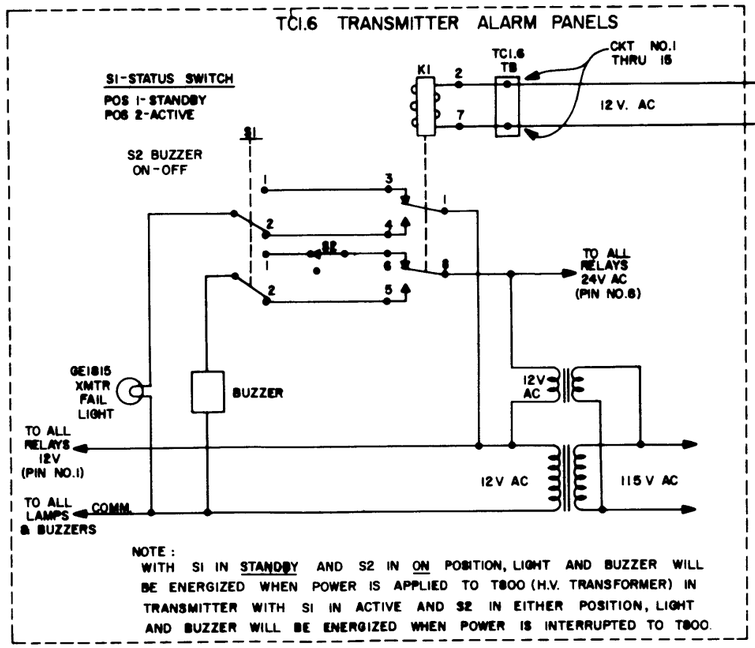
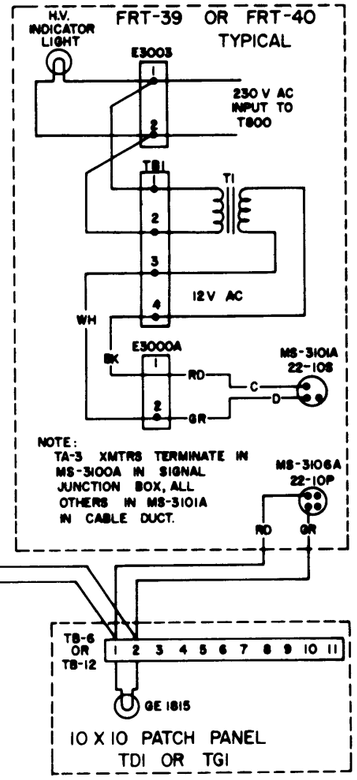
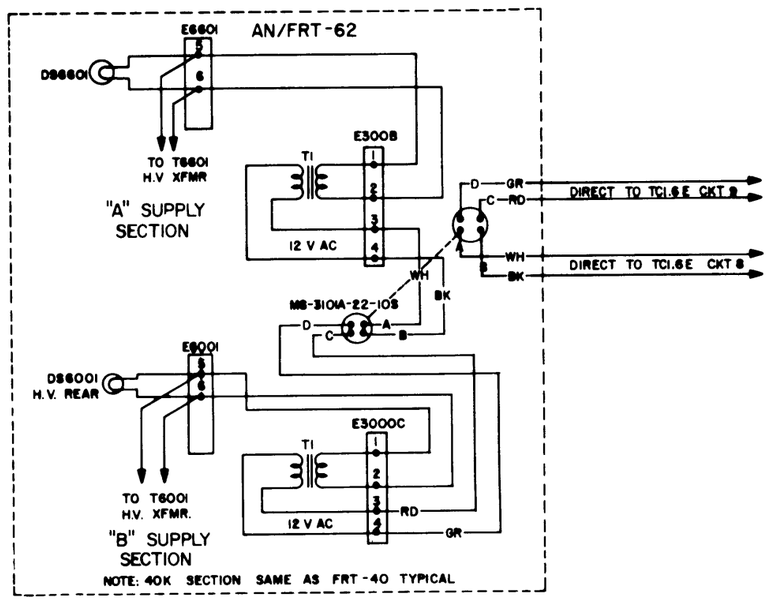


Figure 3-1. Typical Transmitter Indicator, Alarm, Control, and Monitor Circuits, Simplified Schematic Diagram









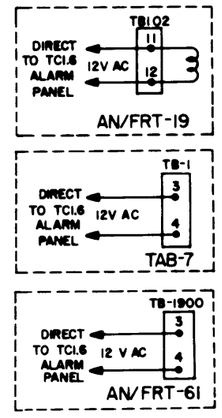


Figure 3-2. Transmitter Radiation Indicator and Alarm Circuits, Wiring Diagram

3-8. The 12-volt radiation indicator circuit is extended from the coaxial patch panel to a transmitter alarm panel in control container TC1. The transmitter alarm panel (see figure 3-3) contains fifteen alarm circuits each-consisting of a 12-volt relay, two toggle switches and a 12-volt indicator lamp. Five transmitter alarm panels, and one power transformer and buzzer circuit (shown at the top of figure 3-3) which has common connections to all five alarm panels, are installed in rack position TC1.6. The power transformer furnishes 12 volts AC for all alarm panel lamps and 24 volts to operate the buzzer. The transmitter alarm circuit provides both audible and visual alarms when a transmitter high voltage is interrupted, and again when high voltage is restored to the transmitter.

3-9. The transmitter alarm panel circuit in figure 3-2 is shown in the normal operating condition that exists while high voltage is applied to a transmitter. STATUS switch S1 is the ACTIVE position, and alarm relay K1 is energized by 12 volts from the step-down transformer at the transmitter. Under these conditions, no power is applied to the buzzer or the alarm lamp.

3-10. Whenever high voltage to the transmitter is interrupted, the relay becomes de-energized reversing the relay contacts which apply power to both the buzzer and the lamp, providing the control operator with audible and visual indications that the transmitter is off the air. The operator may silence the buzzer and extinguish the lamp by placing S1 in the STANDBY position. When the high voltage is restored to the transmitter, the relay becomes energized and applies power to the buzzer and lamp through the STANDBY contacts of S1, providing the control operator with audible and visual indications that the transmitter is back in service. The operator may silence the buzzer by placing S2 in the OFF position, or he may restore the alarm circuit to normal operating condition by placing S1 in the ACTIVE position.

3-11. TRANSMITTER RF MONITOR CIRCUITS.

Facilities for monitoring the RF signal of each transmitter are provided in the transmitter control container TC1. Five SPP-30416 RF monitor patch pan els are installed in rack position TC1.8. Each patch panel contains sixteen coaxial switching jacks providing a total of 80 RF monitor positions. The RF monitor signal from each transmitter is fed through RG-58/U coaxial cable to a jack on the patch panel as shown at the bottom of figure 3-1. In the AN/URT-19(V) transmitters, the RF monitor signal is taken from J2705 at the rear of the frequency amplifier (CHG-2A) unit. In the remaining high-frequency transmitters, the RF monitor signal is taken from a UG-274/U TEE which was added to the rear of the auxiliary power panel APP-3. The RF monitor circuit may be utilized at a remote position to spectrum analyze any transmitter within the complex, or utilized to compare the transmitter internal frequency standard with the station frequency standard.

3-12. TRANSMITTER EXTENDED INTERLOCK CIRCUITS.

The interlock circuit of each high-frequency transmitter is extended to an associated coaxial patch panel in container TD1 or TG1. The interlock circuit at the coaxial patch panel is wired in such a manner that a transmitter using coaxial feed to the antenna cannot be energized unless an antenna or a dummy load is connected to its output.

3-13. The modified interlock circuit of the AN/URT-19(V) transmitters is illustrated in figure 3-4. The interlock circuit to the coaxial patch panel is wired to terminals 7 and 8 on terminal board E501 in the auxiliary power panel APP-4. The interlock circuit wired to terminals 5 and 6 of E501 is used in the balanced/unbalanced AN/URT-19(V) transmitters only. The interlock circuits of the remaining high-frequency transmitters are wired to the coaxial patch panel from terminals 8 and 10 of terminal board E3000 on the center shield assembly of the transmitters as shown in figure 3-5. When using a balanced line output from these transmitters, it is necessary to strap terminals 8 and 10 on E3000 in order to energize the transmitter. Interlock circuits are not provided to the coaxial patch panels from the low-frequency transmitters since their RF outputs are either balanced line to the helix or straight wire feed which do not terminate at the coaxial patch panels.

3-14. AN/URT-19(V) TRANSMITTER RACK WIRING.

Figures 3-6, 3-7 and 3-8 are the rack wiring diagrams for the AN/URT-19(V) transmitters. Five of the transmitter frames have provisions for both balanced and unbalanced RF output (figure 3-7) and five are equipped for unbalanced RF output only (figure 3-8). The exciter frame wiring, shown in figure 3-6, is identical for both types of transmitters. Figure 3-9 shows the wiring changes in the auxiliary power panel (APP-4) of all the AN/URT-19(V) transmitters.

3-15. The push-to-talk relay is installed at the rear of the exciter frame behind frequency amplifier CHG-2. The relay is mounted on a bracket which is fastened to an A panel at the rear of the frame. The relay coil is wired to terminals 1 and 2 and the contacts to terminals 4 and 5 of TB1. Cable 9 connects TB1 with terminal board E1300 on the CHG-2. Terminals 4 and 5 of E1300 are connected across the contacts of B+ switch S2101, placing the relay contacts in parallel with the switch. The B+ switch is a front panel control on the CHG-2, and is placed in the OFF position for push-to-talk operation of the transmitter. The coil of the relay is wired through cable 5 from terminals 1 and 2 of E1300 to terminals 27 and 29 of E502 on the APP-4 in the transmitter frame (see figures 3-7 and 3-8).

3-16. The EXT KEY terminals on E303 of the CMO unit, which provide a method of CW keying the transmitter that is not used at this station, are strapped to close the cathode circuit of an RF amplifier in the master oscillator. CW keying at this station is accomplished by keying a TH-39A/UGT unit which provides a 1000-cycle tone that modulates a channel of the transmitter.

3-17. Cables 5, 6 and 7 in the transmitter are lengthened and re-routed through the base from the exciter to the transmitter frame. The original cabinets were equipped with feed-through connectors in

the sidewalls between the two frames for these cables. The feed-through connectors are not used in the AN/TSC-35 equipment racks. AC connector J908 is added to the exciter frame to provide power to the KP-875 fan assembly.

3-18. A step-down transformer that furnishes 12-volt power for the radiation indicator and transmitter alarm circuits is mounted on a bracket directly behind the APP-4 in the transmitter frame. The transformer is wired to TB-1900 which is fastened to the bracket. 115-volts AC is wired to the primary winding of the transformer through cable 14 and pair 2 of cable 4 from the PS-4A power supply unit. The 115 volts is taken from terminals 5 and 6 of E701 which are connected across the primary winding of the high-voltage transformer in the PS-4A. The 12-volt output of the transformer is wired from terminals 3 and 4 of TB-1900 to a coaxial patch panel.

3-19. A strap between J202 and E203 at the rear of the RFD-1A unit in the transmitter frame was removed and terminal E203 is grounded. Terminal E203 is an RF output connector to an AX-198 antenna changeover relay. The AX-198 is not used in this communication system and was removed from the transmitter.

3-20. A TRC-3500/50 balun and a QDP-6C1S3 RF patch panel were added to the transmitter frames of five AN/URT-19(V) transmitters to provide balanced output capability. (See figure 3-7.) Cables 2 and 3 provide the RF connections to these units, and cables 12 and 13 are the external interlock and the added internal interlock wiring, which is shown schematically in figure 3-4.

3-21. AN/FRT-62 DRIVER SWITCHING.

Figure 3-10 is a wiring diagram of the AN/FRT-62 coaxial switching system that provides local or remote drive capability for the transmitter. Switching of the local or the remote 40-kw driver output to the input of the 200-kw power amplifier is controlled by LOCAL-REMOTE switch S1 on the driver control unit. Switch S1 is a non-locking switch with spring return to the center position. The normally closed contacts of S1 are connected in series with the transmitter interlock circuit and are set to break contact before the normally open contacts close. When switched to either the LOCAL or the REMOTE position, S1 opens the transmitter interlock circuit then applies power momentarily to coaxial switches number 1 and number 2. The coaxial switches are the latching type and remain locked in the switched position until they are switched to the opposite position by S1.

3-22. The coaxial switches are shown in the LOCAL position which connects the local 40-kw driver to the 200-kw power amplifier through S201. In this position, the amber indicator lamp I1 is lighted through the contacts of S202, and the coaxial switches are set so they can be switched to the REMOTE position through the contacts of S204. When S1 is switched to the REMOTE position, the output of the remote 40-kw driver is connected to the input of the 200-kw power amplifier through S201, and the local 40-kw driver output is switched to a coaxial patch panel by coaxial switch number 2. In this position, both the red indicator lamp I3 and the white indicator lamp I2 are lighted through the contacts of S202 in the coaxial switches, and the coaxial switches are set so they can be switched to the LOCAL position through the contacts of S207.

3-23. Relays K1 through K4 (in the relay box) switch the ALDC circuits, the interlock circuits, and the 40-kw READY circuits of the selected 40-kw driver to the 200-kw power amplifier. These relays are controlled through the contacts of S205 in coaxial switch number 1.

3-24. TD-410/UGC MULTIPLEXER RACK.

Figure 3-11 is a wiring diagram of the TD-410/UGC multiplexer rack which is installed in the control container rack position TC1.11. The original rack wiring provided for ten TD-410/UGC units which are wired as shown at the top of the rack. Six additional units, added to the rack at a later date, are provided with terminal strips (TB1) at the rear of the shelves to facilitate installation and wiring.

3-25. TYPICAL CIRCUITS.

Figures 3-12, 3-13, 3-14 and 3-15 are provided to show typical circuits handled by the station. These diagrams are considered self-explanatory and will not be detailed here.

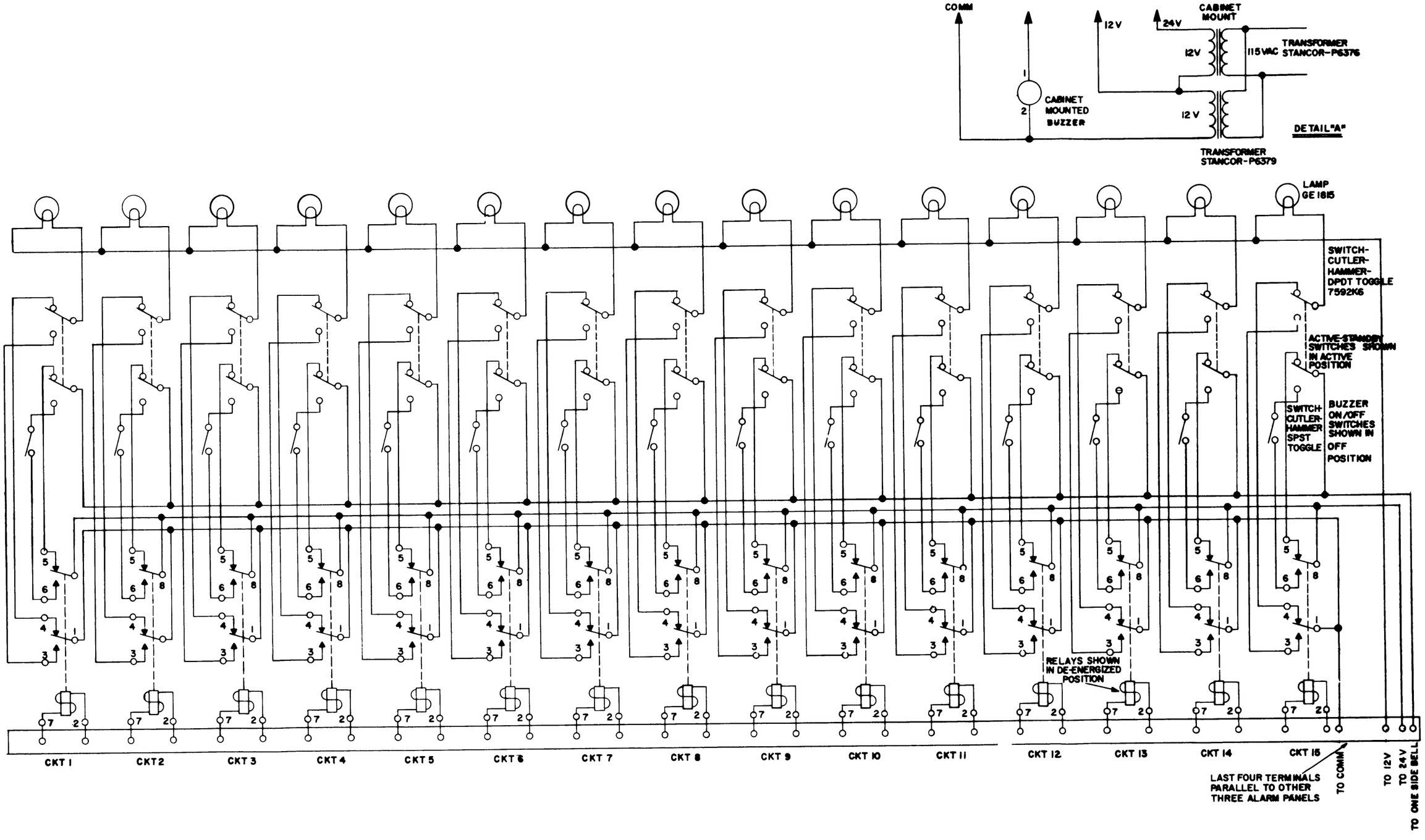


Figure 3-3. Transmitter Alarm Panel Schematic Diagram

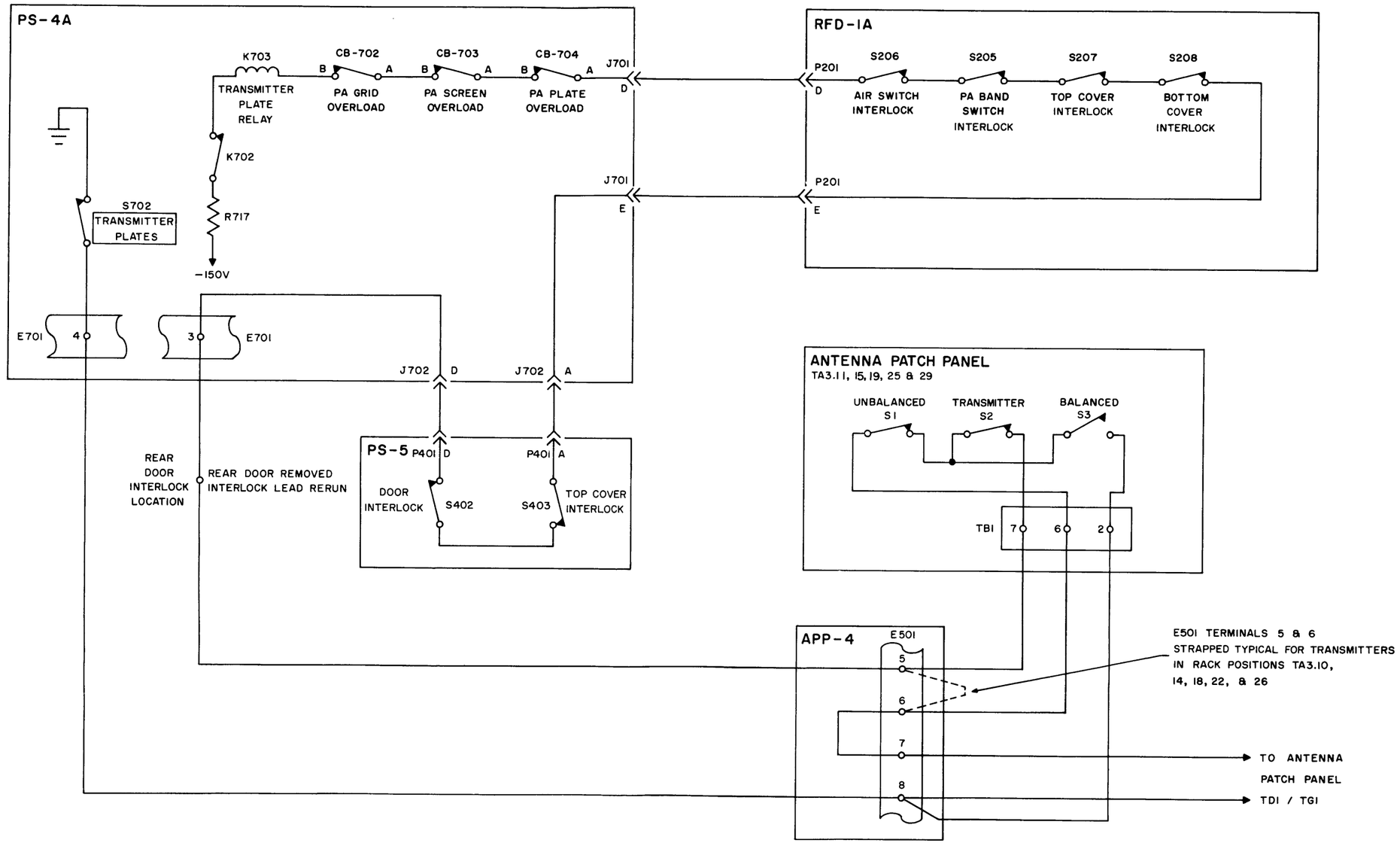


Figure 3-4. AN/URT-19(V), Modified Interlock Circuit, Schematic Diagram

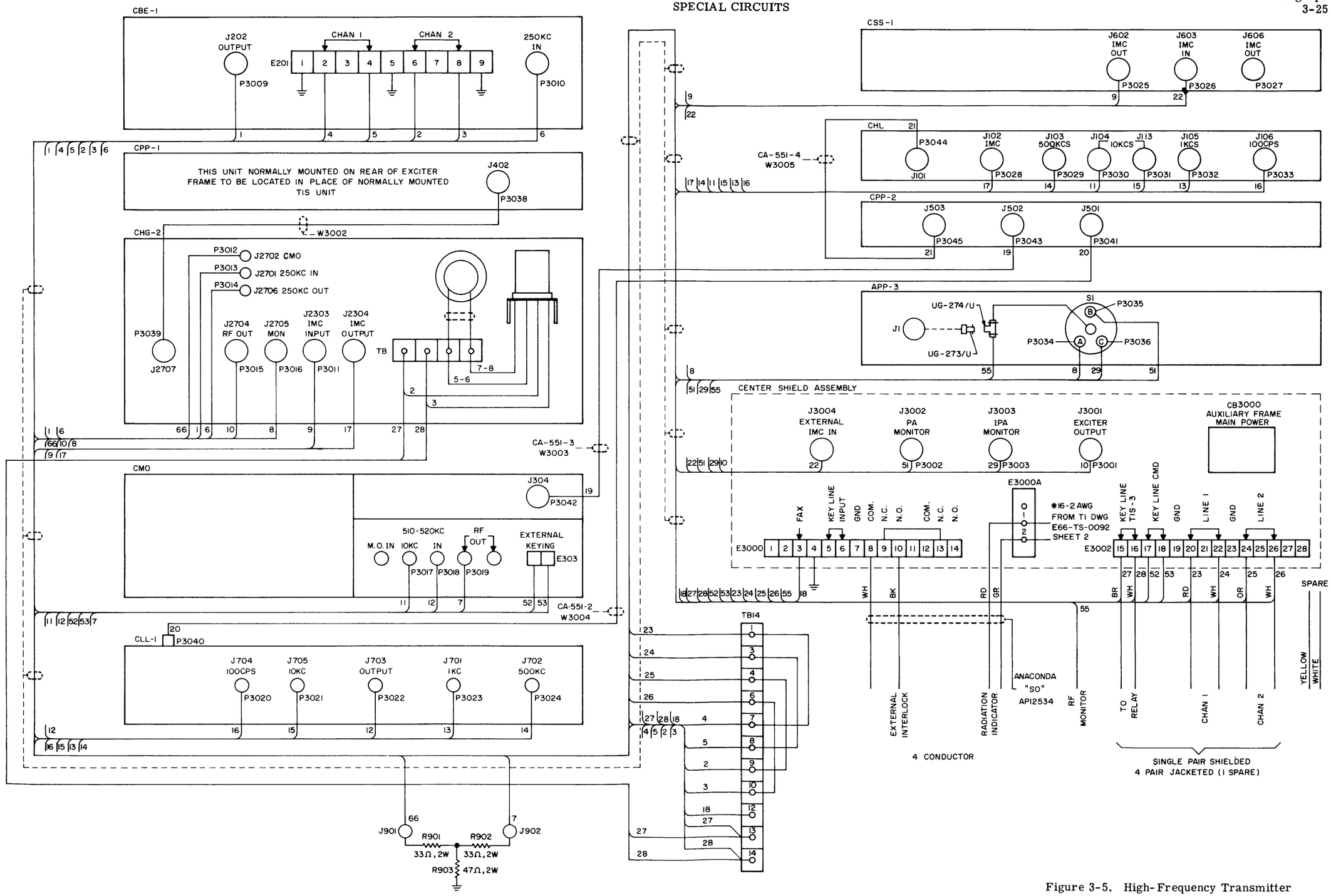


Figure 3-5. High-Frequency Transmitter Exciter Harness Modifications

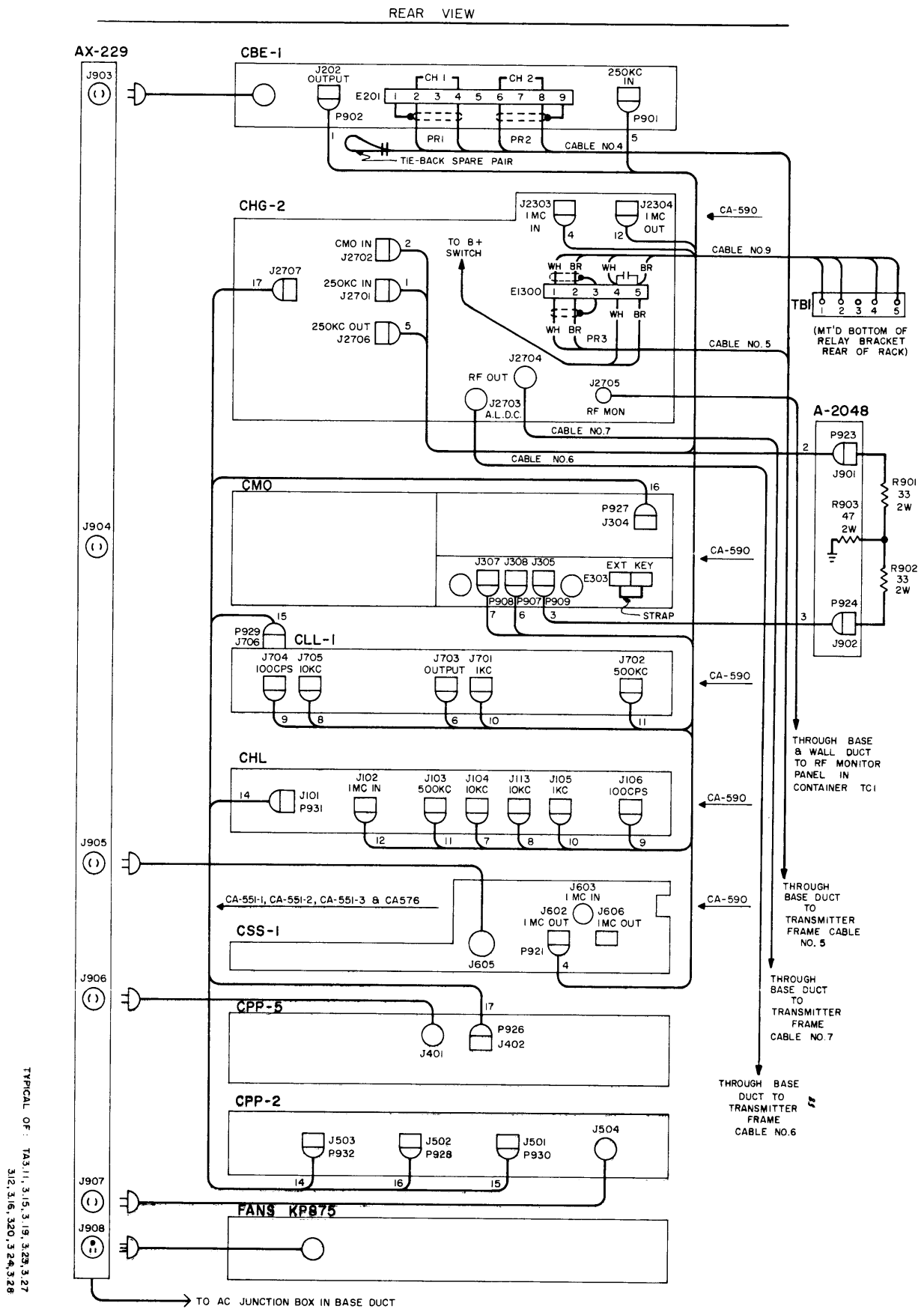


Figure 3-6. AN/URT-19(V) Exciter Frame, Wiring Diagram

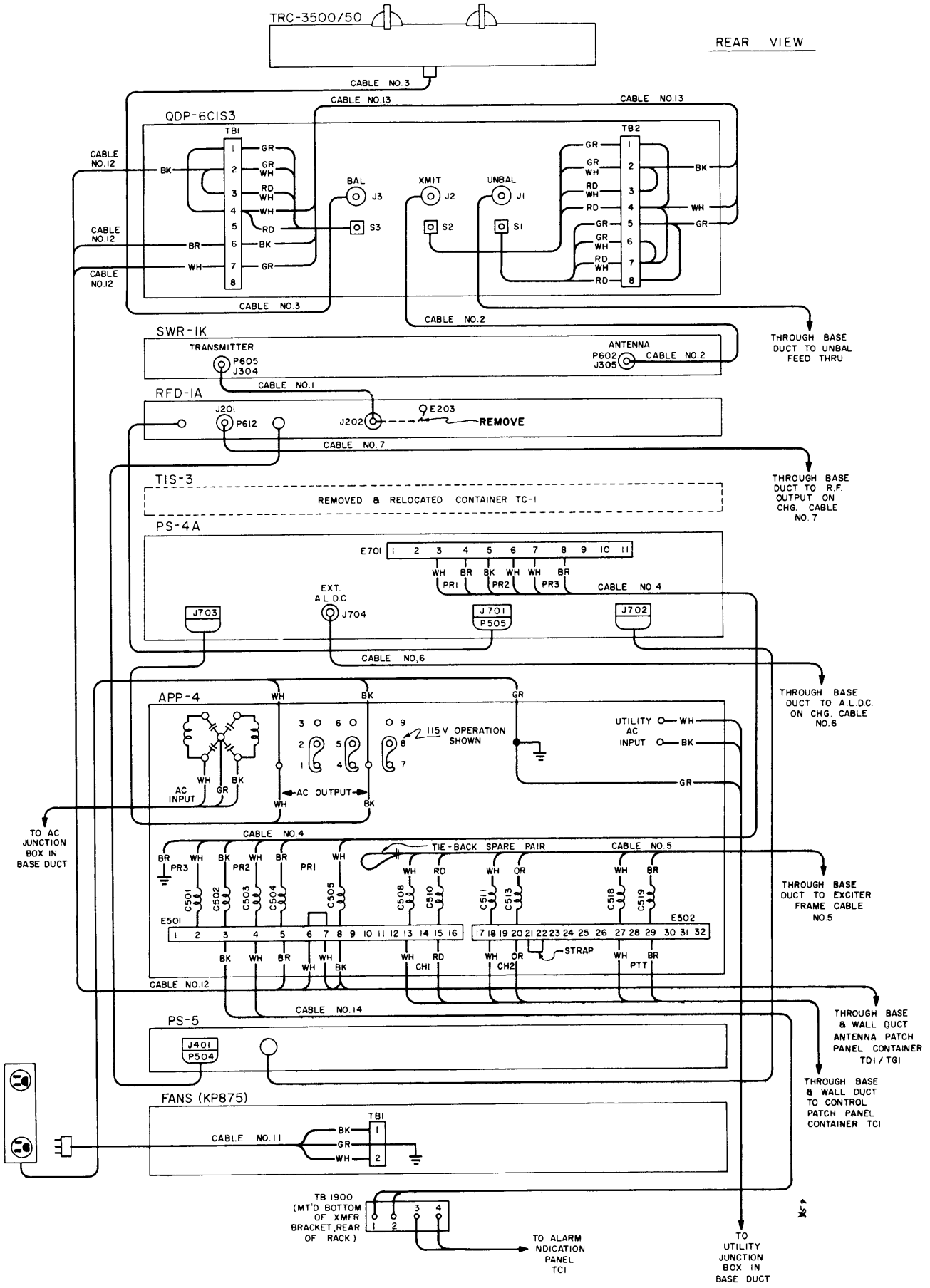


Figure 3-7. AN/URT-19(V) Transmitter Frame (Balanced/Unbalanced), Wiring Diagram

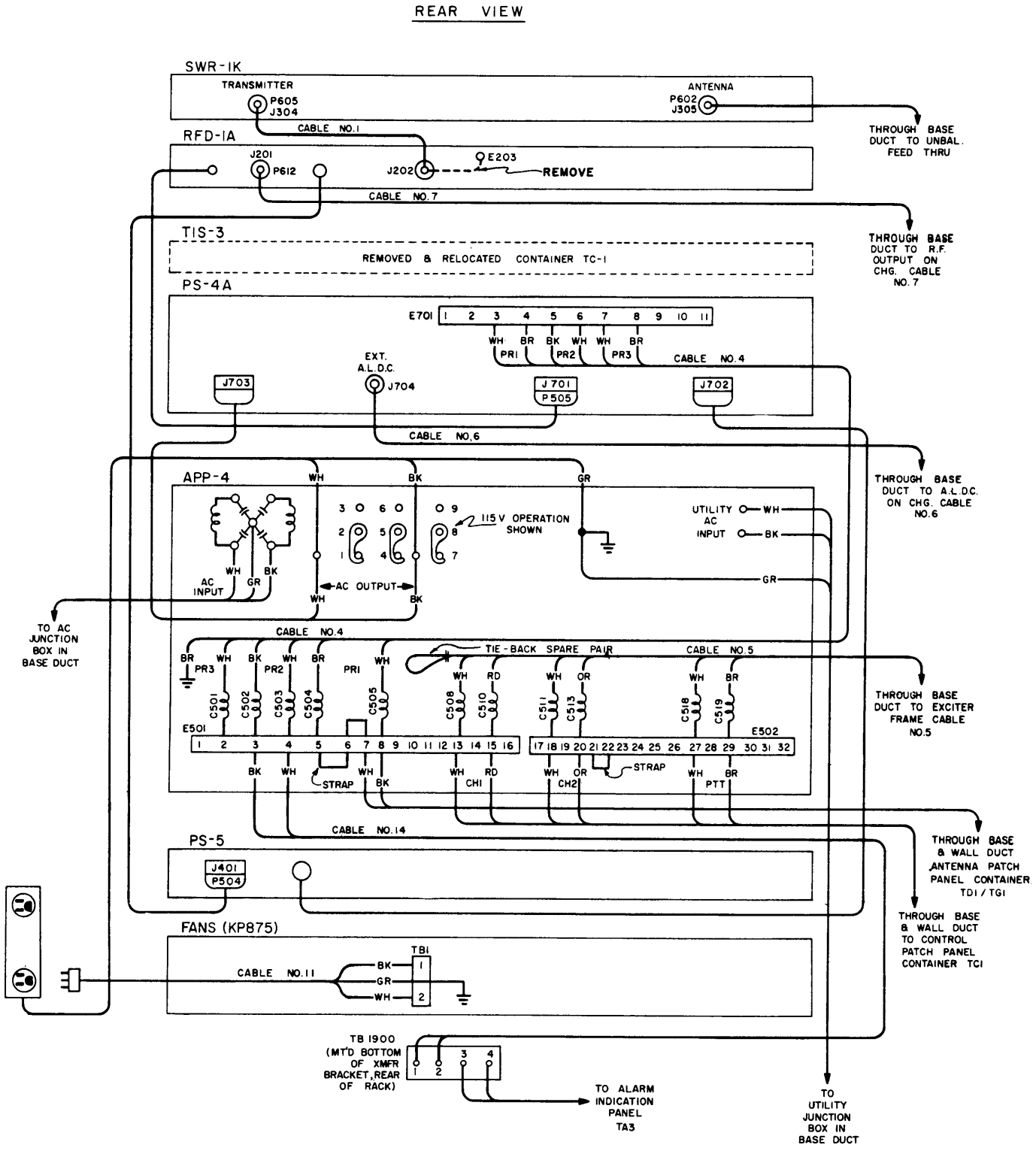
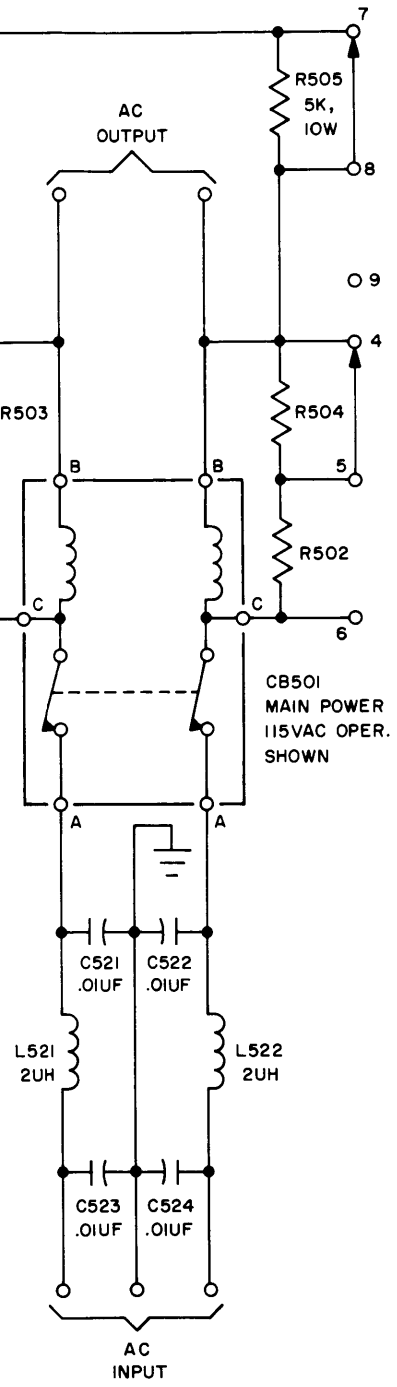


Figure 3-8. AN/URT-19(V) Transmitter Frame (Unbalanced Only), Wiring Diagram

OR 230VAC OPERATION OF CB-501 (IF DESIRED)

. REMOVE STRAP MARKED → FROM TERMINAL 1, AND ATTACH TO TERMINAL 3.
" " " " " " 4, " " " " 6.
" " " " " " 7, " " " " 9.



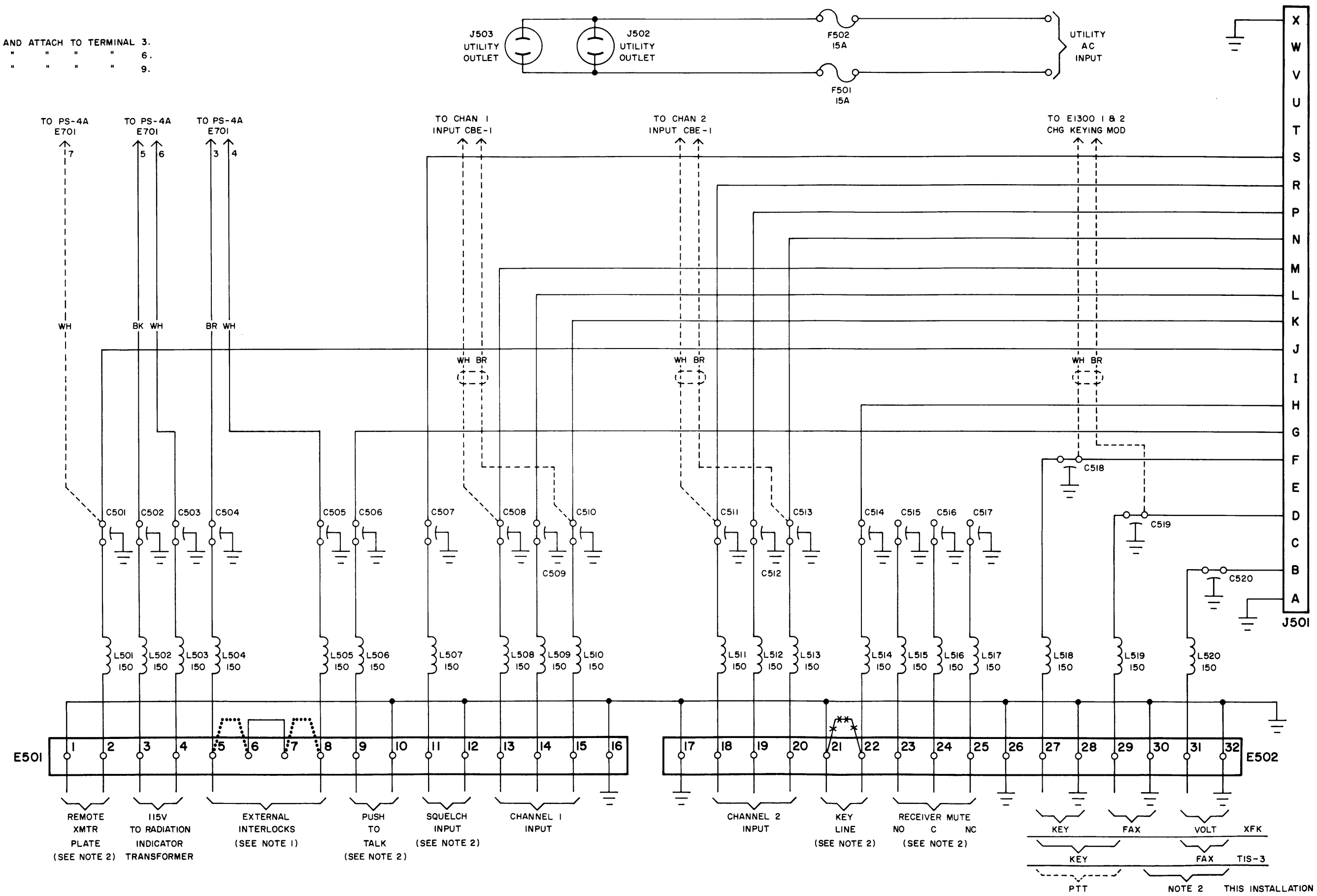


Figure 3-9. AN/URT-19(V) APP-4 Modifications, Schematic Diagram

FOR 230VAC OPERATION OF CB-501 (IF DESIRED)

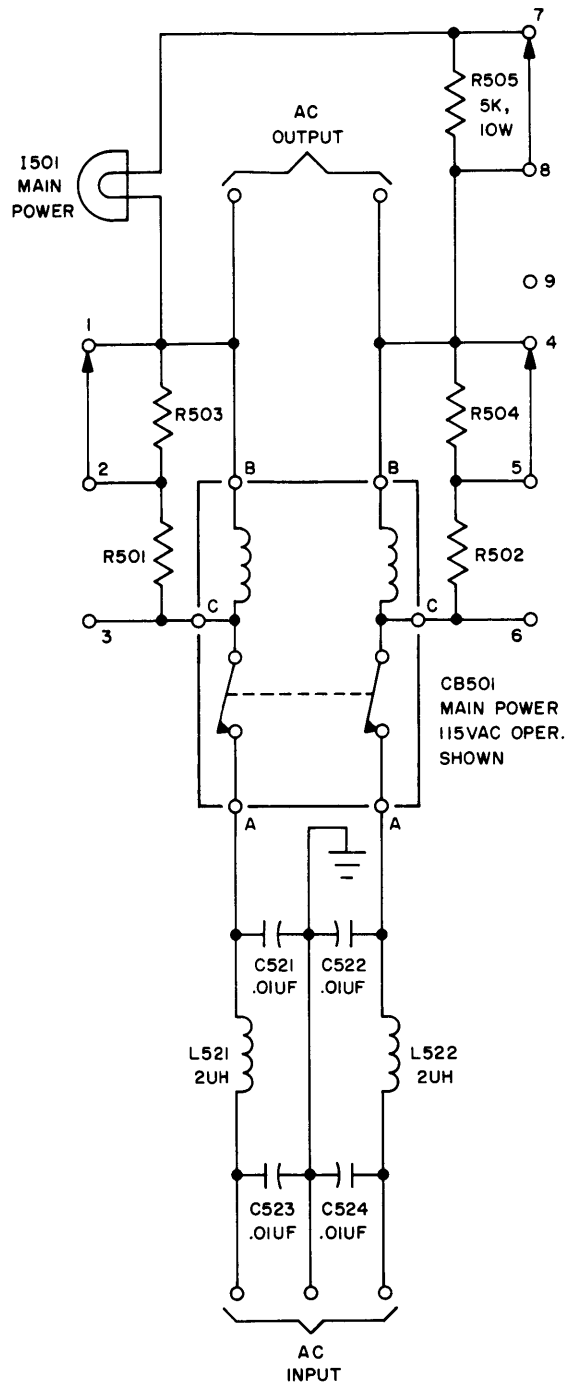
1. REMOVE STRAP MARKED → FROM TERMINAL 1, AND ATTACH TO TERMINAL 3.
2. " " " " " " 4, " " " " 6.
3. " " " " " " 7, " " " " 9.

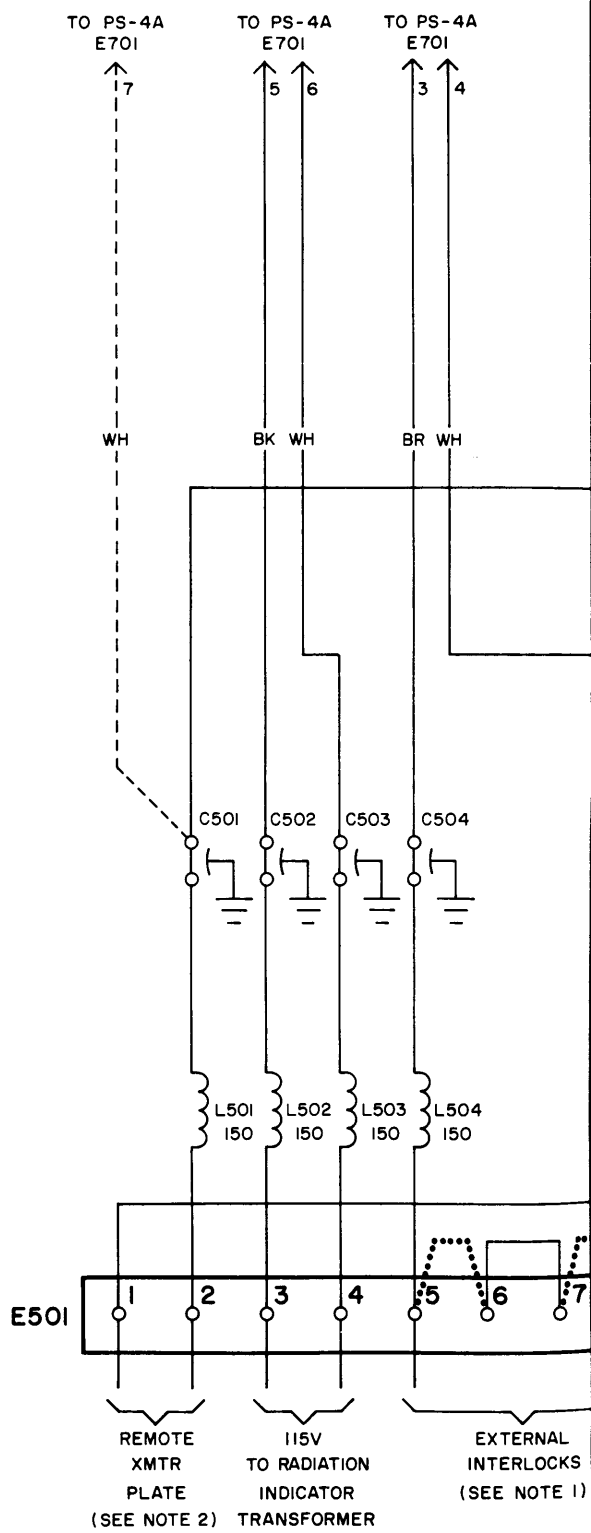
MODIFICATION LEGEND:

•••••••••• DELETED
------ ADDED
——— UNCHANGED

NOTES:

1. REMOTE PATCH PANEL INTERLOCK PAIR TERMINATION - TERMINALS 7 & 8 (ALL 1KW TRANSMITTERS):
   (a) TRANSMITTERS EQUIPPED WITH PATCH PANEL — NO STRAPPING.
   (b) TRANSMITTERS NOT EQUIPPED WITH A PATCH PANEL — STRAP 5 & 6.
2. NOT UTILIZED THIS INSTALLATION.
3. C501 THRU C520 ARE 1,000UF.





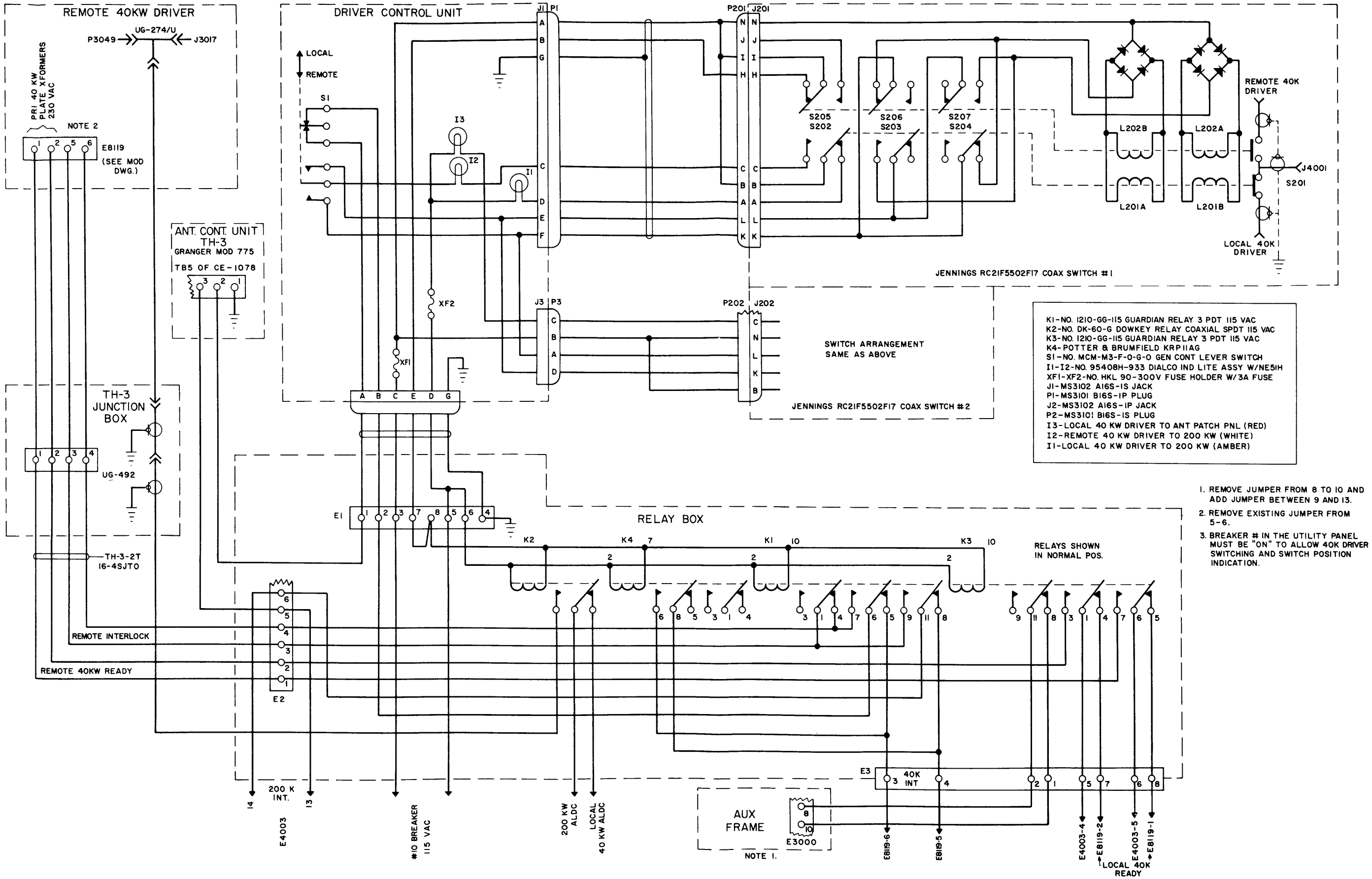


Figure 3-10. AN/FRT-62 Driver Switching, Schematic Diagram

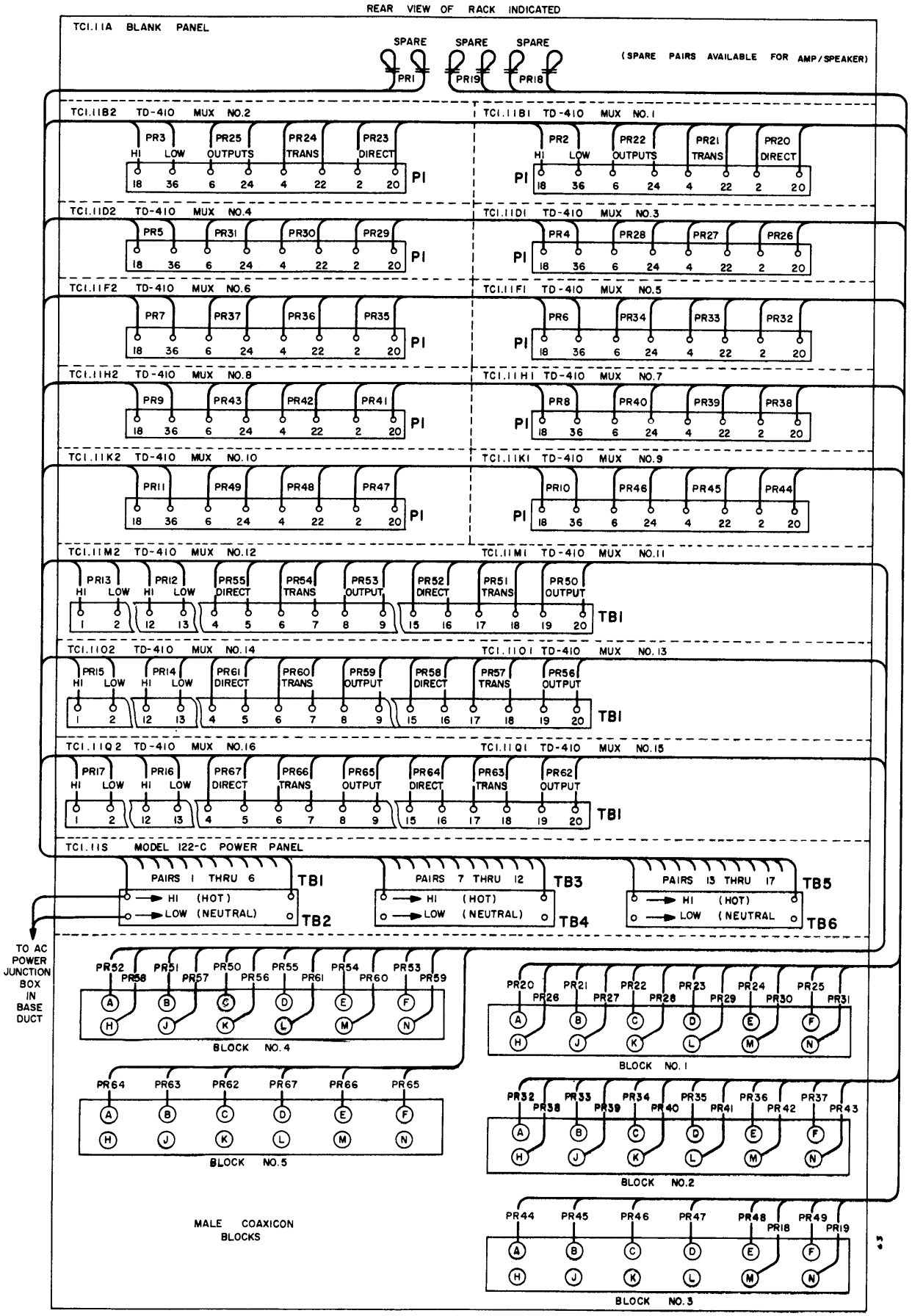


Figure 3-11. TD-410/UGC Multiplexer Rack TC1.11, Wiring Diagram

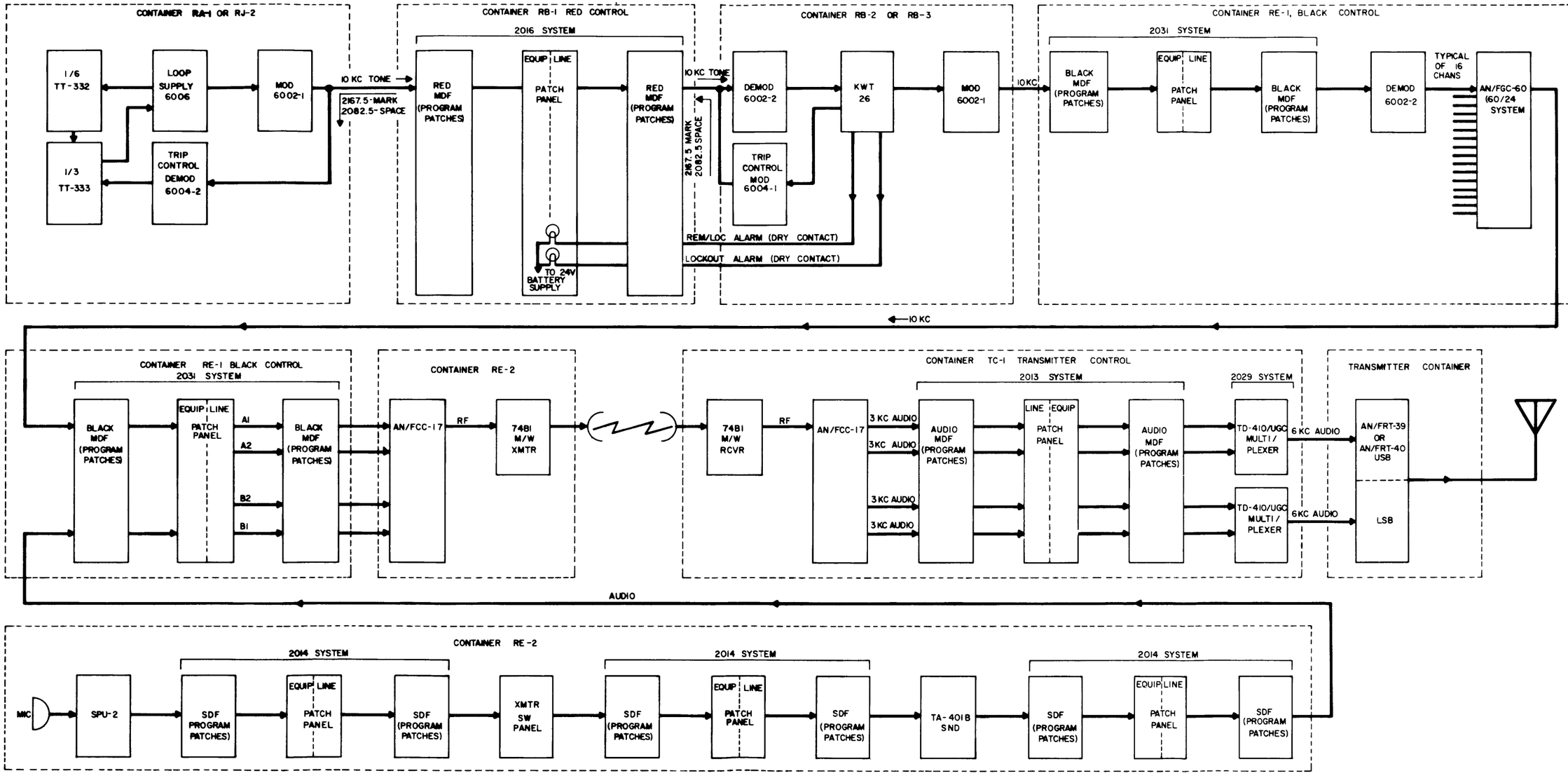


Figure 3-12. Typical Point-to-Point Send Circuit

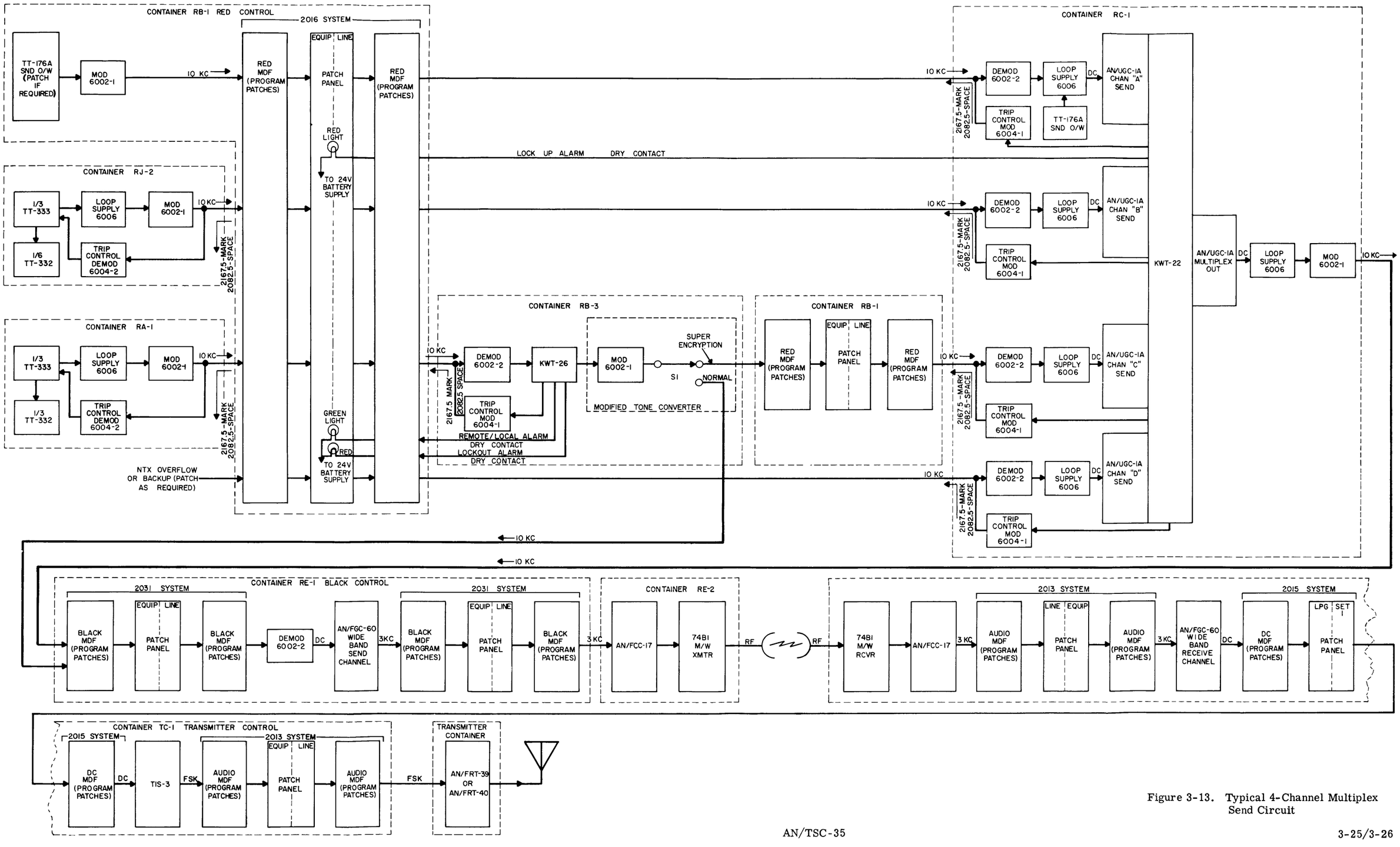
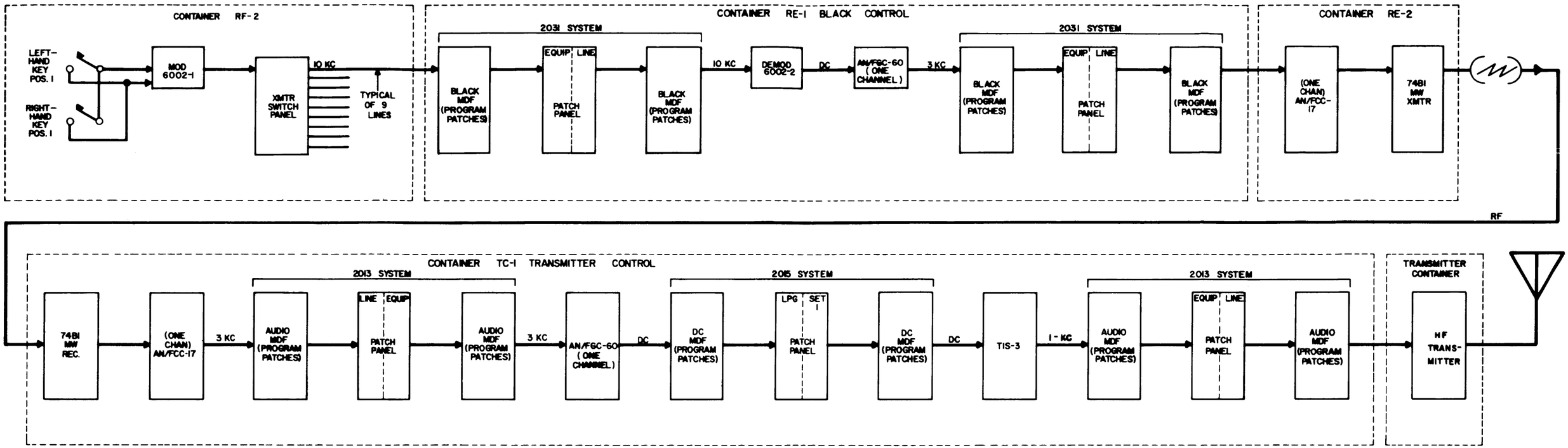


Figure 3-13. Typical 4-Channel Multiplex Send Circuit



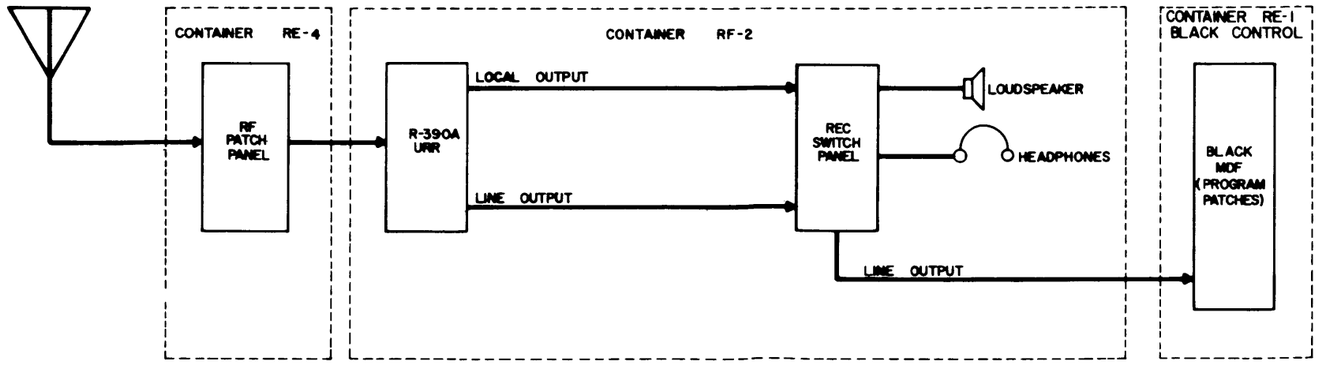


Figure 3-14. Typical CW Circuit

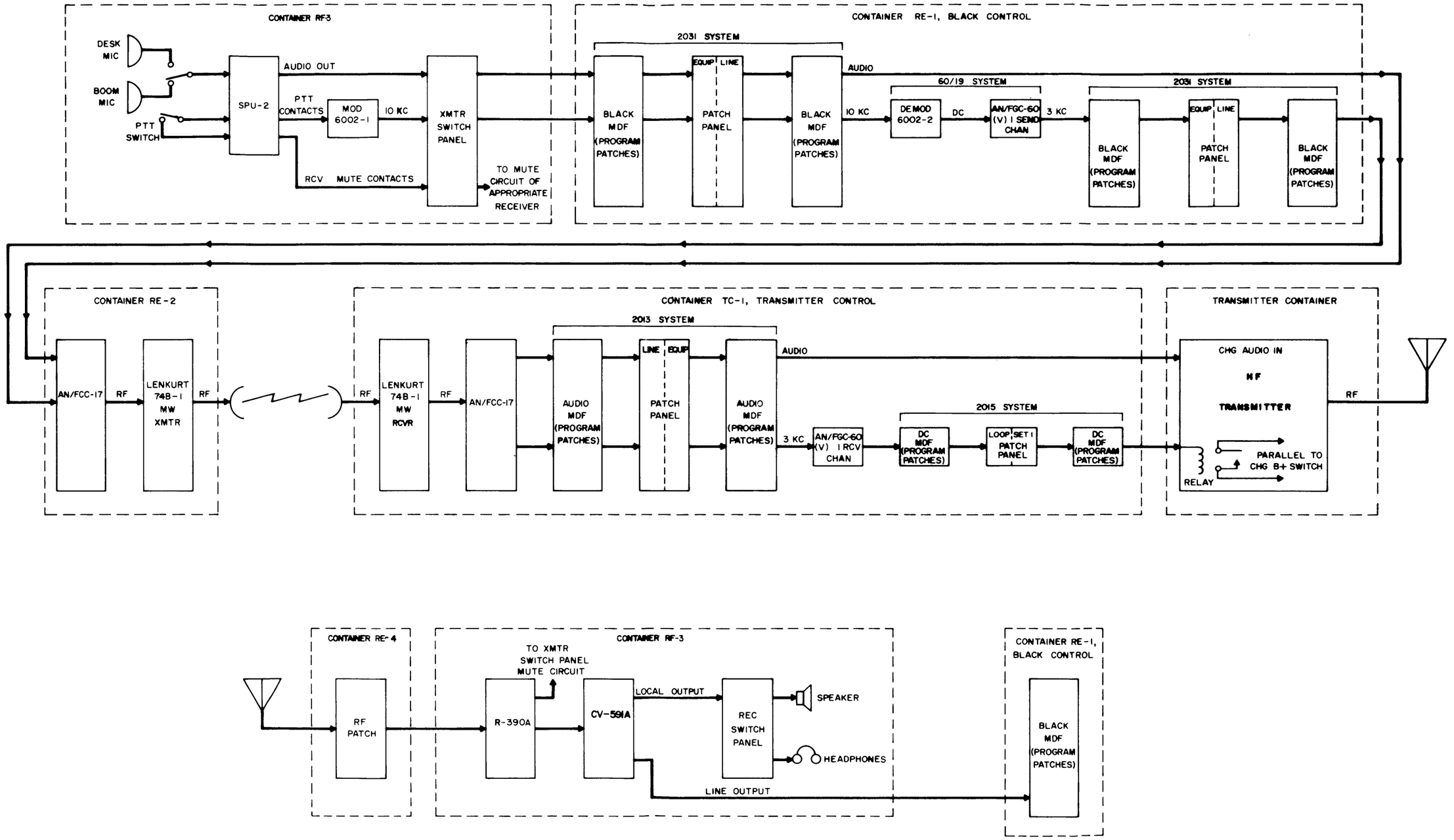


Figure 3-15. Typical Voice Circuit