

Operating Specifications & Characteristics of Standard Model 105 Telegraph Page Printer

TELEPRINTER CORPORATION

26 Park Place
Paramus, N. J.

The model 105 "MITE" Parallel-input teleprinter is a transmitting and receiving page printing telegraph set. It may be used either as a communications device, to send and receive messages over various types of multiplexing equipment, on radio links or wire lines; or as a read-out device for computers. Its very low signal wattage, 5 milliamperes at 3 volts operating into a 600 ohm purely resistive load permits operation with high-speed, low current/voltage transistors or subminiature vacuum tubes. For operation with relay-type readout stages, the Model 105 can supply its own signal line battery, thus further simplifying computer design.

Gears for speeds from 60 to 150 words per minute (60 to 15 characters per second) are available. However, due to the operating characteristics of the Model 105, it will accept any input speed that is less than the gear speed without further change. Thus, for monitoring use on several circuits, each operating at a different speed, one printer, set for the highest speed in use, will suffice.

The Model 105 may be operated as a complete send-receive package, or by addition of a small power package to the keyboard, it may be separated into modules and provide maximum utilization of available space.

SIGNALLING CODE AND FEATURES

The code used by the Model 105, is the standard 5-level Baudot code. However, instead of receiving and transmitting this code in serial form, the Model 105 accepts all 5 bits of information simultaneously. One major difference between the Model 105 and serial printers such as the Model 104 is that the former draws no signal line current during at-rest periods and machines may be withdrawn from signal lines without interrupting their operation. Although the Model 105 operates polar internally, it will accept either neutral or polar line signals.

KEYBOARD FEATURES

The Model 105 keyboard can be supplied either as an integral module of the teleprinter, or as a separate self-powered package. In either case it will transmit either a parallel code alone, or both parallel and serial codes simultaneously. These two codes are electrically and physically independent of each other and are brought out on separate pins in the connector. The parallel transmitter assembly also has its "start" contacts electrically independent of the code contacts so that starting may be done with clock timing pulses from sources other than the intelligence signal source. The start pulse may be provided at any point in the transmission cycle. The Model 105 Keyboard is removable without the aid of any tools and it may be stored in the electrical chassis when receive-only operation is desired or when space limitations preclude its use. The Keyboard is a 3-row, fully banked style plus space bar.

DESIGN FEATURES AND SERVICING

It should be noted that the miniaturization of the overall machine has been accomplished without any drastic miniaturization of the components. The unit has been designed for extra-simple maintenance and servicing. The printer section of the unit breaks down into basic sub-assemblies; the ribbon magazine, the printer section; the main shaft; and the selector section. The breakdown into these sub-assemblies is accomplished with the loosening of 6 clamps and takes less than 10 minutes. The re-assembly takes less than 20 minutes. All parts are readily accessible for inspection, lubrication and servicing. Experience has shown that personnel with previous experience in servicing teleprinter equipment can be taught to service this equipment in one week's time, while personnel experienced in servicing typewriters and/or other business machines can be taught to service this machine within two week's time, provided they have the requisite basic electrical knowledge.

NOVEL FEATURES

This machine differs radically from conventional equipment in that there is no storage of selection required. The selector is positioned upon receipt of the code information. Receipt of the start signal then permits the positioning of the type cylinder immediately thereafter.

The employment of a type cylinder located behind the recording medium is a unique feature of the Teleprinter Corporation "MITE" and is incorporated in the Model 105. This positioning of the cylinder does away with the need for a neutral position between characters in order to render visible the last character printed. The cylinder goes directly from one character to the next. The very light weight of the cylinder permits high speed carriage return. The placement of the type cylinder behind the copy also means that type faces are never clogged with ink and dirt and need never be cleaned.

The machine is designed to operate in any position, horizontal, verticle, or even upside down, and thus readily lends itself to aircraft or mobile applications.

OPERATING SPECIFICATIONS

MODEL 105 PRINTER

1. Motor Voltages:
 - (a) 110 volts, AC 400 cycle, 3 Phase.
 - (b) 26 volts, DC.
 - (c) 110 volts, AC 60 cycle, 1 Phase.
2. Power Requirements:
 - (a) Approximately 60 watts.
 - (b) Approximately 45 watts.
 - (c) Approximately 68 watts.
3. Receiving Signal Requirements:

3 volts at 5 milliamperes. Input load is 600 ohm purely resistive. Standard 5 level Baudot code plus start pulse. Can be adapted for other 5 level or 64 character, single case, 6 level code. Accepts neutral or polar signals.

Gear Speeds:

60, 75, 100, 125, 150 words per minute.

Operating Speeds:

Any speed from 1 wpm to rated speed of gear installed. No manipulations required for changing speed within gear range.



Operating Options:

External or internal battery, simplex or full duplex operation.

Keyboard Features:

Standard communications keyboard with "Repeat", "Break" and "Bell" keys plus "Space" bar. Transmits serial code, parallel code, or both simultaneously. Parallel start signal can be electrically isolated from remainder of signals, and parallel signals are electrically and mechanically isolated from serial signals. Keyboard contacts diode isolated to prevent "sneak" circuitry when several keyboards are connected in parallel. Standard $\frac{1}{4}$ " bank on keys. Keyboard may be placed in storage position or removed completely.

Inking Ribbons:

Standard $\frac{1}{2}$ " Underwood type, self-reversing.

Recording Medium.

Standard full size roll ($4\frac{1}{2}$ " diameter x $8\frac{1}{2}$ " wide) pressure feed paper. (Sprocket feed can be provided)

Characters per line:

75.

PHYSICAL CHARACTERISTICS:

Weight:

Receiving Printer
12 lbs. 6 oz.
Transmitting Keyboard
3 lbs. 13 oz.
Connecting Chassis (400AC)
3 lbs. 9 oz.

Connecting Chassis (DC)

2 lbs. 12 oz.
Ribbon Dust Cover
0 lb. 13 oz.
Airborne type carrying case
4 lbs. 10 oz.
Shock mounts
1 lb. 9 oz.
Full size standard paper roll
3 lbs. 0 oz.

NOTE: Above weights are approximate and subject to variation.

Dimensions:

Receiving Printer:

$12\frac{1}{4}$ " wide x $8\frac{3}{4}$ " deep x $3\frac{1}{4}$ " high.

Transmitting Keyboard:

12" wide x $8\frac{1}{4}$ " deep x $1\frac{1}{2}$ " high.

Combined unit in Airborne type carrying case with full roll (In Receive-only position).

$13\frac{1}{2}$ " wide x $14\frac{3}{4}$ " deep x $5\frac{5}{16}$ " high

Same as above but in send-receive position:

$13\frac{1}{2}$ " wide x $17\frac{7}{8}$ " deep x $6\frac{3}{16}$ " high

For shock mounting add $1\frac{1}{4}$ " to height.

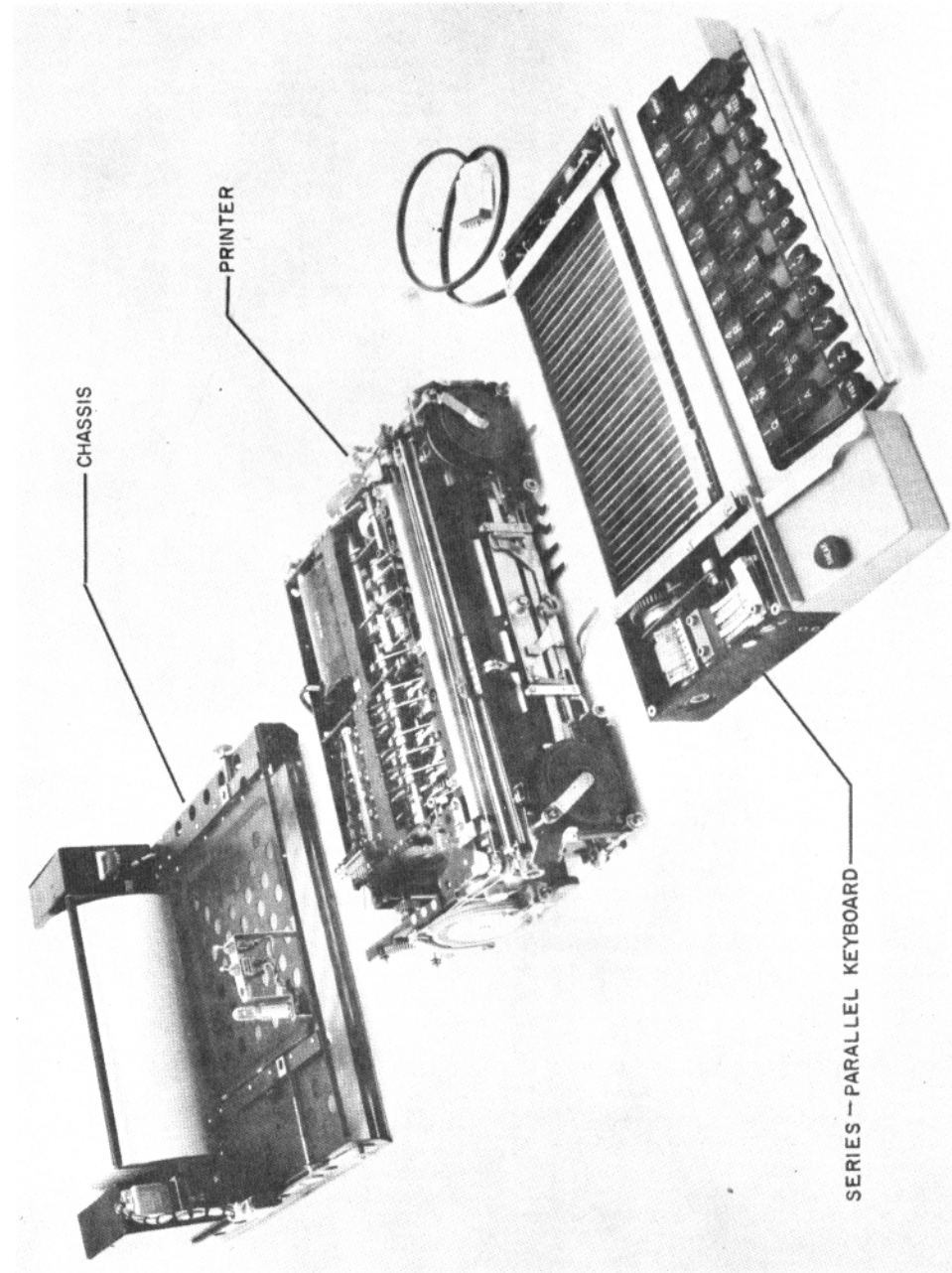
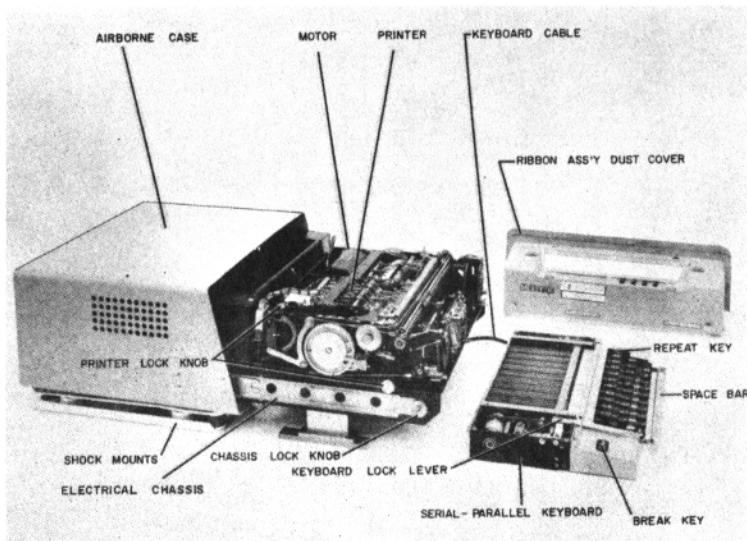
NOTE: Changes in operating speed range accomplished by change of one gear by non-technical personnel requiring less than one minute. Machine automatically adjusts to any speed within speed range.

Signal Input-Output:

JAN type screw connectors mounted on rear apron.

Power Input:

Same connectors as above.



A YEAR OF RTTY IN VK LAND

ERIC FEGRUSON, VK3KF

The sun was peeping over the eastern horizon on the morning of May 24th, 1958 when the last wire was pushed into place and the Model 15 switched on. There was not even a commercial RTTY signal to be heard on the air at that hour and so it became necessary to wait — Oh! well some sleep would not be amiss and we have a sked with KR6AK this afternoon.

At last 0630 GMT. and the expected call from "Cas" right on the dot — CW contact established — now for the big moment "G.A. RTTY Cas" — The printer bursts into life and after a few stutters that well known "bed time story" of KR6AK's unfolds before my eyes. "The time has come the walrus said, etc., etc.," and so the first amateur radio T.T.Y. contact out of VK-land is under "full steam ahead" — My turn to transmit and I'm so excited I cannot think properly, let alone pick out the keys in my one finger style. I have checked back on that first contact many times. Reception was 98% which I thought rather good for the first attempt — The contact was completed and I listened around the frequency (21.083 Kcs.) and hear more RTTY — make careful adjustments, the signal is not strong.

I'm not printing well but that is how chatter and my own call sign appears. Finally get enough on the printer to identify a QSO between W7GEK and W2RUI — Too late in the day for good W signals, but there is always tomorrow.

Another day dawns and with the help of signals from ZQK (who fortunately transmits on 60 W.P.M.) I make further adjustments to the T.U. to enable me to print weaker signals — Lunch is forgotten, the XYL is not happy; but an ear is kept on the 21 MCS band — plenty of CW but no RTTY; but wait what is this? RTTY! and a healthy 59 signal — The printer comes to life — Tape from W6CG Temple City. My finger is ready on the T/R switch — Will he tune up to my crystal locked freq.? Will I-V.F.O. and call him on CW first? Let's settle for CW. — It is history now — that first VK - W RTTY QSO, two way contact being established at 0425 GMT., May 25th, 1958. I have read this copy many times, so many times in fact I almost know it by heart.

That day was really thrilling and lives as perhaps the, real high light of more than thirty years of "ham" radio. Following W6CG, contacts were made with K6OWQ, Mary, then Carl W8GIG, Geri KL7ALZ, and Nick KL7MZ, the band holding up until 0830 GMT. The next day saw the DX extended to Beep WØBP. During the week I could not be on the air at a suitable time for stateside contacts; but KR6AK was contacted at night as was KH6EM — The week-end added W7LPM, VE7KX and W2RUI to the list, the latter QSO establishing an amateur RTTY world DX record.

In the following month W6KOY/MM, W9ENC, W8CRY, W6WOC, W8HYG, K6JPR, W3PYW (for a new DX record) and WØFQW were added to the list. The afternoons of Saturdays and Sundays (Friday and Saturday nights in USA) were fully occupied and many enjoyable contacts made. During July additional stations contacted were W6NRM/6 and W6HIF and regular skeds with KR6AK maintained twice weekly and with W6CG and WØBP once a week.

During August, activity appeared to decline in the states and the afternoons were no longer worked by the continual chatter of the Mod. 15. Only one new station added, W6CQI/6 and if it had not been for the regular skeds with KR6AK and W6CG my interest may have waned — Trust "Cas" to keep me "up to scratch."

During the next couple of months the "list of stations worked" increased with the addition of ZL1WB, W4IYP, W4EHU, KL7AUV and W7GEK. I was very pleased to at last contact Vern as his RTTY was the first U.S.A. station printed back in May. About this time "Cas" KR6AK was experiencing "typhoon" troubles and some of our skeds were missed out — That beam of Cas' had some ups and downs.

During October stateside activity on 21 was practically non-existent. Apart from the weekly skeds with W6CG only had one RTTY QSO for the month, this with W8GIG. Bruce, ZL1WB also inactive at this time awaiting F.S. permit and Cas still raising and lowering antenna. October changed to November and stateside signals went out even the "pipe line" to W6CG

suffered a blockage. Activity now confined to twice weekly skeds with KR6AK and an occasional contact with Bud, W6KUY/MM when he was in the North Pacific. — 1958 gave away to 1959 and I have a suspicion RTTY'ers must hibernate during the winter months in U.S.A. A check through the log indicates but five contacts during Dec., Jan. and Feb., these with KL7AUV, K6UKK, W6CG and WØBP. By this time the RTTY gear was looking very untidy, the XYL was most unhappy about it and "requested" that something be done about it — Such a "request" being law in the VK3KF establishment, the "clean up" was put into effect, and for six weeks during February and March the shack was denuded of everything and a tight schedule set to be back on the air by the end of March — The schedule was made tougher by the intrusion of the XYL once more who now demanded paint to walls and ceiling, a cracked pane of glass replaced and a hundred and one things attended to which only the female eye can spot. However by burning considerable quantities of midnight oil and spending my days at work in a state of semi-consciousness, the job was done by the due date. The shack was resplendent with its bright new paint, the windows glistened, the lino. on the floor displayed its long hidden pattern and the roof no longer leaked. The transmitter final amp. had been rebuilt, L/C ratios had been adjusted to optimum, the long open wire to the beam renewed, an additional element added to the beam and impedances rematched — the last possible watt was going to be dissipated in the antenna — when the time came to try it out, the improvement was marked, radiation had increased by 4 DB in a given direction. I was satisfied I'd be ready for those RTTY'ers when they returned from their winter hideouts; but here it is June and only one or two have shown up. If it had not been for the regular contacts with "Cas" KR6AK and Bruce ZL1WB I think I would have wrecked the RTTY layout and made room for more V.I.F.F. gear. The 21 MCS band has been open nightly to USA and Allen W4IYP consistently worked; but apart from K8JON who made one fleeting appearance and must have been stunned by his achievement — His first three RTTY QSO's providing him with three countries (W - ZL and VK) the band has been spurned by the regulars of a year

ago. Brad K6JPR made one appearance too and participated in a four way, three country hook up (K6JPR, W4IYP, ZL1-AHO and VK3KF). Where oh! where are those "regulars"? Geri and Nick KL7ALZ and MZ, Bud W6CG (Don't tell me I know — S.S.B.) Skipper W2RUI, still licking the sweepstakes wounds?? and others with whom I used to enjoy a keyboard chat? Maybe I should not complain as a year of activity resulted in 270 RTTY QSO's with 36 different stations, 6 countries in three continents. Of the 36, many were only worked once and the vast majority of contacts were with KR6AK (92) with W6CG (31), ZL1WB (29) and W6KUY/MM (18). Those four stations account for 170 out of the total.

No doubt the greatest activity in the USA is confined to the local nets; but I wonder how many RTTY'ers realize that three ZL and one VK station are active and can be contacted with comparative ease between 0300 and 0700 GMT on 21.083 to 21.085 kcs. Friday and Saturday nights from April through October. How about a thought for us lonesome fellows who have no local contacts to keep us interested and have to rely on USA activity for a QSO?

And so to a second year of RTTY?

Those contacted two way during the past year are: KR6AK, KH6EM, KH6IJ, KL7ALZ, KL7MZ, KL7AUV, VE7KX, ZL1WB, ZL1AHO, ZL1AKW, W2RUI, W3PYW, W4IYP, W4EHU, W6CG, W6AEE, W6KUY/MM, W6DTN/MM, W6WOC, W6NRM/6, W6HIF, W6CQI/6, K6OWQ, K6JPZ, K6ZBL, W7LPM, W7GEK, W8GIG, W8CRY, W8HYG, K8JON, W9ROQ, W9ENC, WØBP, WØFQW and WØTOB.

Thanks fellers!

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W6NRM / RTTY At The San Mateo Hamfest

By BOB WEITBRECHT, W6NRM

June 7, 1959

Upon invitation from the San Mateo Hamfest committee, a RTTY exhibit was arranged consisting of an actual on-the-air operating station, complete with all accessories such as tape equipment, full-sized transmitter, complete receiving setup, and other items that make for ease of operation. Insofar as possible, the entire station was made to be a representative of a typical fully equipped amateur RTTY system.

It is always interesting to see "how portable" one can make his station, no matter whether high powered or low powered. W6NRM has always strived to make equipment as portable as possible—in the feeling that permanent fixtures such as wall rack mounts, heavy power supplies, multiple installations, and the like make for a really fixed and immovable station. With this view in mind, all equipment is designed and simplified as much as possible yet retaining all the optimal operational characteristics. Operating controls are centralized right at the printer table. Various features such as telephone-line remote control systems are planned for and built into the equipment.

As the photographs show, W6NRM/RTTY is contained in three general packages—the Transmitter package, the Printer package, and the Receiver/tape gear package. The three units are tied together by means of multiple conductor cables, thus enabling the Station to be placed into operation within a few minutes after being set up on location. The Cabinets are fitted with four barn door pull handles apiece, together with heavy duty casters, thus enabling the heavy things to be easily transported from place to place. Indeed the handles are a godsend, as they enable four men to "lift" each cabinet down from trailer to ground or vice versa. Each cabinet weighs about 400 to 500 pounds! The printer—a Model 26 with terminal unit mounted on the rear—is relatively light in comparison.

The Transmitter package consists of a 400-watt 813 final, driven by a high-stability heterodyne VFO, and completely equipped with power supplies plus a re-

ceiving unit of the telephone-line remote control system. The R-F output from this rig is fed into a variety of antennas, beams, etc., through suitable tuning networks. At the Hamfest, a 66 foot piece of wire was used—end fed affair running mostly at a 20 foot height level. A parallel tuned L-C was employed to feed this wire, being driven by the rig through a link coil. Quite a bit of R F develops at the end of the antenna, as some fellows will attest! They came close enough for their ear lobes to touch this wire—WHOOM! Practically an electric cauterizer! So we had to "rope off" the hot area to keep the public from meddling with the R-F floating around the place.

The Receiver cabinet consists of a Panadaptor, a BC348 Q receiver, the transmitting unit of the telephone line remote control system, and finally at the bottom the tape equipment, containing a Model 14 typing reperforator and the W6NRM/W9TCJ electronic tape distributor with tape-head. The heaviest unit is the typing reperforator and hence it was placed right on the bottom floor of the cabinet, thus tending to compensate for the top-heavy tendency generated by the Panadaptor-receiver at the top. Boy, that scope unit is h-e-a-v-y! But it is a swell unit, and makes for ease of monitoring the adjacent channels for RTTY and CW QRM. The BC348Q, which has been in continuous operation at W6NRM/W9TCJ since 1945, is of course a modified unit, incorporating 85 kc double-conversion Q-fiver, voltage regulation on both HFO and BFO, and a souped up front-end. Furthermore provision is made for remote tuning the receiver—by means of a diode circuit working upon the receiver's high frequency oscillator—from the operating position. All in all a fine, sensitive, and stable receiver—optimally designed for RTTY work.

The telephone-line remote control system is a five-tone affair permitting the Transmitter to be placed up to several miles from the operating position, thus materially aiding in a for a cleaner station arrangement. With these five tones, ranging from 1300 to 6000 cps, plus D-C multiplexing onto the telephone line (com-

positing), the Transmitter can be programmed to do what the operator desires such as: Main power control, exciter control for CW and FSK, HV power control, and VFO tuning high or low. Alternatively the DC compositing can be polarized as to enable control of two transmitters. The VFO dial is turned by means of a Vee-belt operated by the gearhead motor mounted just below the exciter, as the photograph shows. Smooth and precise control is obtainable by push-button control—one can move a few cycles or up to some 10-20 kilocycles up or down. No provision has been yet made for tracking of final and antenna tuning controls, though. Space is left on the R/C panels for a telemetering system for indicating 813 plate current and Micro-match reading back to operating position, for the obvious reason of monitoring the transmitter itself.

The printer is a Model 26. The printer table is wired for centralized operating convenience, and has a W6NRM/W9TCJ "Little Gems" terminal unit mounted on its rear. Auxiliary circuits are installed for Bell break and Conference operation. And keyer tubes are provided for operating the Model 14 typing reperfer from the TU output. For receiver tuning on FSK signals, a pair of magic eyes show deflections on Mark/Space, and a potentiometer is used to tune the receiver remotely—as explained above—by means of a D-C voltage over the cable to the receiver's diode circuit. This indicator-tuning system is contained in a little black box on the left side of the Model 26. The right-side black box contains all the operating controls for XMIT/RECEIVE, typing reperfer control, and TD control, plus retransmitting.

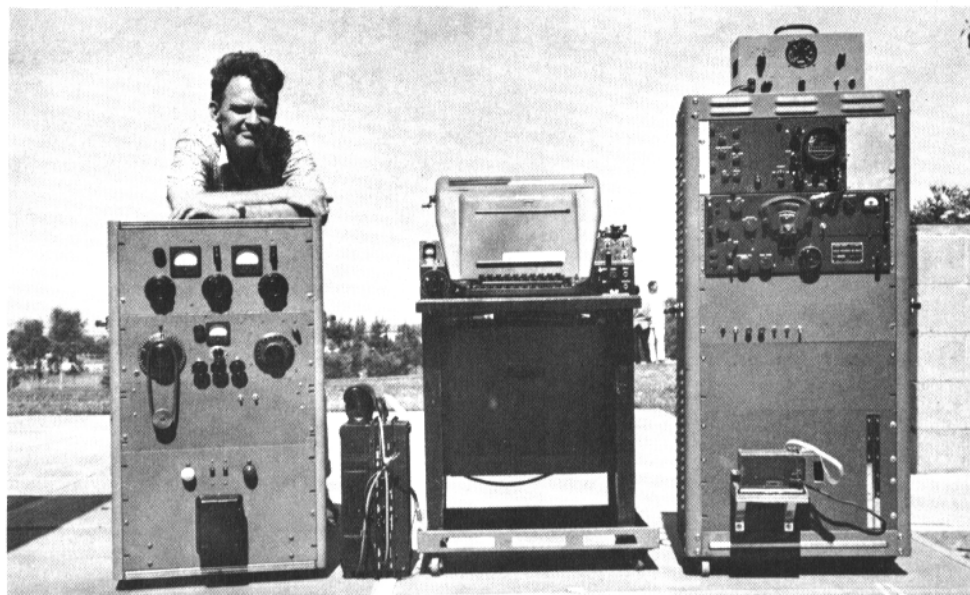
The entire station was in operation at the Hamfest from 10 a.m. to 2 p.m. on the 7140 kc spot, and numerous contacts were made with RTTY stations as far north as Portland and down south to Pasadena—with excellent and solid QSO's. About an hour of Conference Circuit operation was held with Bob Mead, K6GZ, a few miles north—K6GZ being on 3620 kc and W6NRM being on 7140, and both stations set for "signal-return local-copy." It was quite a revelation to have such convenient intercommunication with each other, without manual switching of any kind aside from obvious keyboard operating. Full breakin is available at all times.

During the period Bob transmitted a "picture art" showing a pair of Hawaiian hula dancers over the conference RTTY circuit to the enjoyment of the public on-lookers. Bart W6OWP and his family happened along, and he was promptly placed in touch with Bob, and an enjoyable conversation followed. Also K6DYX—a top-notch traffic hound—was at the hamfest, and he got in touch with Bob in regard to certain things at K6GZ—seemed like Bob had some sort of a Schuttig diversity adaptor that he wanted to give away.

Finally after four hours of operation we had to shut down the gear so the raffling could continue undisturbed by all the noise. So W6NRM/6 went off the air, and the entire gear was pulled apart and placed on W6UQ's trailer for hauling back home. Some concern was felt about the trailer's construction and we were indeed very careful to avoid bumps or sudden stops or else the heavy things would break through the front or floor of the trailer. HI. All in all it is felt that the W6NRM/6 equipment is quite a bit heavy, and thus indicates a need for further lightening and compactization. Time will tell. In retrospect, attention is called to the W9TCJ exhibit at the Starved Rock Hamfest in Ottawa, Illinois back in summer of 1956. Much the same gear was carried 100 miles directly south from Williams Bay, Wisconsin in a real rugged trailer. Sure a lot of effort and work to move and set up gear, but it's all in fun and we wanted to demonstrate RTTY to the 'unwashed multitude' as old B.P. liked to refer to. And many interesting tests were made, among which was the first auto-start call to the home printer from the hamfest station on 3624 kc. With an optimum portable RTTY station, one can do many things!

I wish to express sincere appreciation to Charlie W6UQ and Tommie VE2AGF/W6 for their efforts to help with the equipment moving and set-up. All in all a grand time was had, and reports were had of the favorable ham-reaction to this RTTY exhibit. Maybe we'll have a few more converts, yet!

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W6NRM/6 at San Mateo Hamfest 6/7/59



Bart W6OWP Operating W6NRM/6

INSTRUCTIONS FOR THE MODIFICATIONS OF THE COLLINS KWS-1 TRANSMITTER VFO FOR FSK KEYING

WM. H. CARTER, JR., W5ANW

The Collins KWS-1 transmitter makes an excellent transmitter for the transmission of radioteletype on the amateur bands. The usual method is to feed a tone into the speech channel and by switching between the tones of 2125 and 2975 cps the result is supposed to be single frequency sidebands 850 cycles apart. This signal if received on a receiver using a beat oscillator should look like an FSK transmission. (If the tones are pure sine waves and the filter is properly matched to remove the unwanted sideband.) However the crystals and the mechanical filter in the KWS-1 are usually not matched well enough to achieve this result. What actually happens is a series of sidebands which cause a lot of QRM and transmit an illegal signal. The better and preferred method is to actually shift the VFO the required standard of 850 cycles or 170 cycles. The following method is simple and works well. It is easy to install and will hold adjustment for long periods.

1. Remove all of the connections as well as the blower vent hose from the amplifier-oscillator section of the KWS-1.
2. Position the exciter unit so that it is resting on the left end and remove the bottom cover plate.
3. Locate the terminal strip to which are attached the leads from the VFO unit. Mark the location of these leads for aid in correct replacement later. Unsolder all of the wires going to the VFO assembly.
4. Next, mark the relative position of the coupling between the VFO shaft and the dial assembly by scoring a line thru the two ends and the center section of the coupling.
5. Remove the antibacklash spring from the coupling. Loosen both front set screws which attach the front coupling flange to the dial shaft. (Note the dial reading and the VFO shaft po-

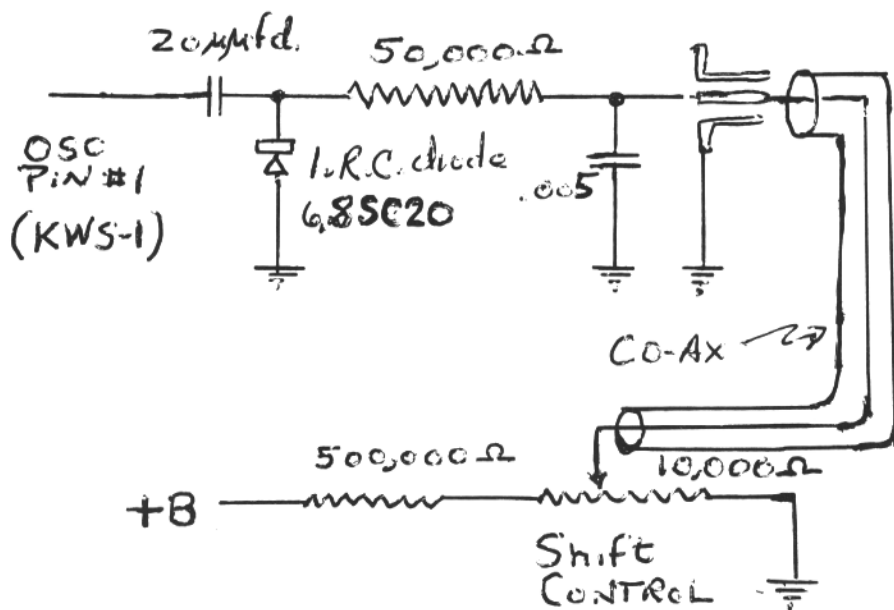
sition by marking for reference in future reassembly).

6. Loosen and remove the screws which hold the brass belt to the "VFO" shaft pulley and the "single sideband select" pulley.
7. Remove the brass belt and the connecting spring. Make a note as to how this is assembled for use in replacing.
8. Remove the (4) Phillips head screws which attach the VFO assembly to the front sub-panel. This requires the use of the special right angle Phillips driver furnished with the KWS-1. Loosen the nut holding the right hand drum dial bearing so that the drum can be lifted out of the way during the removal of the entire VFO assembly.
9. Remove the entire VFO assembly, lifting the rear first and carefully working the assembly out of the top of the cabinet.
10. Remove the cover below the oscillator socket on the VFO unit and drill a hole for a coax connector in the small chassis along side of the oscillator tube socket (on the right side) install the connector in the hole drilled. This will require the careful lifting out of the way of a ceramic condenser and the repositioning of some of the circuit components.
11. Connect the insulated center conductor of the coax connector to one end of a quarter watt, 50,000 ohm resistor and connect the other end of the resistor thru a 20 mmfd silver mica condenser to pin number one terminal of the oscillator tube socket. This connects the center terminal of the coax connector to the oscillator grid thru 50,000 ohms and 20 mmfd in series.
12. Connect the positive side (bar) of the International Rectified Company diode

unit type 6.8SC20 to the junction between the resistor and the condenser of step 11 above. The negative side of the IRC diode type 6.8SC20 is connected to ground. (This is the side marked with the arrow). The International Rectifier Company will furnish a data sheet on this diode unit which they call a "simicap" type 6.8-SC20. This unit costs about \$1.50

13. Connect a .005 MFD ceramic disc condenser from the coax center conductor to ground to act as an RF bypass. Connect a 500,000 ohm (half megohm) resistor between the coax center conductor and the B plus supply to the oscillator. This completes the modification of the VFO unit. Redress the components back into place and insulate where necessary to remove the possibility of shorts to ground or to adjacent wiring. Replace the bottom cover of the VFO tube socket chassis.

14. Reinstall the VFO unit into the exciter-amplifier unit in reverse procedure to that used in removing it. Install a short piece of coax between the VFO connector and a panel connector for connecting a polar relay. Connect a 10,000 ohm pot across the panel relay connection for varying the shift.
15. After the exciter-amplifier is reassembled it must be realigned and the VFO retracked as outlined in the KWS-1 instruction book section 5.2.-3.9.
16. Frequency shift keying is accomplished by shorting the positive bias voltage between the coax center conductor and ground. The amount of shift is determined by the bias voltage which is varied by the 10,000 pot between the coax conductor and ground. The high frequency is the result of no bias and the low frequency is the result of the positive bias.



RESULTS OF THE SIXTH ANNUAL RTTY SWEEPSTAKES CONTEST

The scores and sections taking part this year are given below. Not as many logs were received as there were stations taking part and for this reason, the listing seems somewhat less than in prior contests. Many logs had entries commenting on the fun in this contest.

Highest score was made by Beep, W0-BP with 8448 points for 44 sections. Following Beep was Frank W3PYW with 7854 points and 42 sections. Roy W2-TKO was third with 6396 points and 39 sections. Fourth was Nosey KH6IJ, 4292, and 29 sections, followed by Jim, W5YM with 3968 and 31 sections. Others taking part are listed below.

WIAW	40	10	4
W1BGW	1848	88	21
W1MB	396	36	11
W1RMH	280	28	10
W1WEW	112	16	7
K2HHH	896	56	16
W2TKO	6396	164	39
W3KYR	210	21	10
W3MHD	532	38	14
W3PYW	7854	187	42
W5KQJ	18	6	3
W5YM	3968	128	31
W6AAN	4	4	1
W6AEE	2880	90	32
K6HHH	510	34	15
K6JPR	1044	58	18
W6OGG	8	4	2
K6ZBL	260	26	10
W6ZNU	432	36	12
W7HRC	64	16	4
W7IE	216	24	9
W7LPM	1872	72	26
W7PQJ	612	36	17
W8CAT	1449	63	23
W8CRY	2208	92	24
W8FEU	2214	82	27
W8IJV	1794	63	23
W8LEX	988	52	19
W8NIY	570	38	15
W9BMV	2162	94	23
K9BRL	144	18	8
W9COW	812	58	14
W9YT	240	24	10
W0BP	8448	192	44

W0FQW	1344	32	21
W0ITX	220	22	10
W0JHS	48	12	4
VE3DCC	198	22	9
VE6UB	532	38	14
VE7EP	560	40	14
KH6IJ	4292	148	29
KL7ALZ	1080	54	20
KR6AK	348	29	12

- 0 -

Have been fairly active on RTTY this winter but what's happened to all the activity that used to be on 3620 KC? The spot on 7140 kc sure been cluttered up what with novices drifting down from 7150 and the foreign broadcast stations all around. Sure would like to see some other frequency adopted for the forty meter band as would others I have talked to. Will send you a pic of the station here someday for the mag if you can use it. See you in the spring contest, 73.
-BOB, W7IE

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For Information Regarding the
Society Contact the Following:

W6AEE - Merrill Swan

W6SCQ - Lewis Rogerson

For Traffic Net Information:

W6FLW W6IZJ

For "RTTY" Information:

W6DEO W6AEE

RESULTS OF ARMED FORCES DAY 1959

MILITARY TO AMATEUR CONTACTS

Operating on military frequencies AIR, NSS, and WAR, amateurs worked in the 80 - 40 - 20 and 15 meter bands, using CW, AM, SSB, and RATT. The three military stations made a total of two thousand six hundred and ninety-four contacts.

RADIOTELETYPEWRITER RECEIVING COMPETITION

The radioteletypewriter receiving competition featured a message from the Secretary of Defense transmitted at sixty words per minute. A total of one hundred and ninety-four contestants received a certificate of merit for perfect copy. RATT winners of certificates of merit are as follows:

W1OUC, W2BVE, K2EID/AA2EID, W2GQN/A2GQN, W2HDQ/A2HDQ, K2HHH, K2HJC, W2IGX, W2JAV, W2GDW, W2LRW, W2PAU, W2PEE, W2RUI, W2TAM, W2TKO, W2TOX/A2TOX, W2UAE.

K3APS, VE3BAD, W3CRO, W3DJZ, W3HCE, K3HCE, W3JNE, W3MRD, W3NQA, K3NRB, W3PRQ, W3TUZ, W3YRB, W3ZYK.

W4AIY, W4EHU, A4FJ, K4GFL, W4HNF, W4HXT, K4IVZ, W4KJN/AF4KJN, K4KKZ, K4NAS, K4NDE, K4NRY, W4NWK, W4PHL/A4PHL, K4PSE, W4WMM/A4WMM.

W5BOT, K5BSS, W5DHz, AC5DS/KZ5DS, N5EFA, W5FPD/A5FPD, W5GJH, W5GMM/AF5GMM, N5LTI, N5LTI, K5MBB, W5RDT, K5RHF, K5RXC, W5SQB/AF5SQB, W5SYE, K5THK, W5TVG, K5WAB.

W6AEE/A6AEE, W6ASJ/A6ASJ, W6AXV, K6BHF, W6BIK, K6BPI, W6BYS, W6CAP, W6CBX, K6CHR, W6CQI/6, KH6CQS, K6CXS, W6CZ, K6CZ, WA6DME, W6DOU, AG6FCW, W6FHI, W6FIW/A6FLW, W6FZC, K6GB/AA6GB, W6CDO/AF6GDO, W6GCC, K6GOK, AF6GSX, K6HHD, W6HTS, W6HTS, W6IIV, W6JCK, W6IZJ, K6JIV, K6JPR, W6JOX/AF6JOX, W6/AF6JWF, K6JWQ/AFA6JWQ, W6LFD, W6LDG, W6NRM, W6PCP, W6QIE, K6QMK, W6QYS, VE6UB, W6UJX, K6USN, K6WDV, K6ZBC, W6SCQ, W6CBF, K6HB, K6ZBL.

K7ABB, K7AFI, KL7AIZ, K7BXS, W7CBE, A7CO/W7CO, W7FCS, W7JMH, W7KQK, W7KV, W7LPM, W7MC, W7MEX, W7PVF, W7TUI, W7VI, W7VMN, W7VPH, W7WBB, W7TMF.

W8BWL, W8FEU, W8IJV, K8KBO, K8KLC, W8KPT, W8LGL/AF8LGL, K8MRU, W8PEI, W8WUD.

K9BRL, K9BSL, W9CWH, W9DNP, K9EHP, W9EWC, K9EYY, W9GGH, W9GRW, AF9GVN, W9LKK, W9LOT, K9NBI/N9ADI, W9ONM/AF9ONM, W9OPI, KN9QEE, A9QIK, W9OQKE, W9WKM.

WØBP, WØFQW, WØHAH, AFØJHS, WØLQV/AFØLQV, WØOKH, WØQCZ. Amateur Operators of the Comm. Platoon 1st Battle, Grp 20th Inf.

ANDERSON, W. R.
BROCK, C. E.
BRUMMET, R. K.
CORREA, Horacio
CROW, N. D.
FRISBY, C. E.
GILBERT, T. R.
GOLINSKI, R. L.
GOODMAN, D. J.
GRAHAM, B. H.
HALL, R. F.
HANSON, W. B.
HEWARD, F. R.
MCKINNON, W. A.
MAIS, C. L.
MILLER, F.
QUINN, J. E.
SUTTON, B. G.
RITZEN, Jacob
ROOD, Otis
WIXON, R. R.

The military departments are pleased with the continued increase in participation in these tests and appreciate the interest shown by the amateurs participating. Congratulations to all winners of the Secretary of Defense certificates and it is hoped that next year's participants will exceed the present record.



As you all know the Army and Cal Tech-JPL successfully launched a space probe, Pioneer IV, on behalf of NASA on 2 March 1959.

This probe was made in Pasadena by Cal Tech-JPL. (The antenna by K6QLT.)

The communications necessary to convey the tracking information from Cape Canaveral, Florida, Porto Rico, and Goldstone, California was directed from the jet propulsion laboratory in Pasadena. The cross-country wire and radio teletype and phone circuits terminated and were patched in the communications center of JPL.

Kleinschmidt AN/FGC-25 teletypewriter sets a complete page and tape machine, were used in the wire and radio circuits to transmit and receive the tracking information and to transmit the results computed by the JPL-IBM computer and the standby computer at Rand Corp. at Santa Monica, California.

It is noteworthy in this launching that the communications were conducted uninterruptedly for more than 82 hours, the life of the batteries in the probe. And the results were 100 per cent copy.

The key positions were manned by radio amateurs, headed by Dr. Jack Froehlich, WA6CMF, project director, Dr. Hank Richter, W6VZA W6OQA chief operator. The following also sat for at least 30 hours in front of Kleinschmidt machines, yelling into the phone and having eardrums blasted back, and feeding the hungry monsters paper, without losing a print, W6HCO/4, W6HNX/KP4, W6IIV, and K6QLT.

The radio transmitter on Pioneer IV died out March 6th a 7:15 am. The probe was then traveling at the rate of 3899 mph and it was then 406,020 miles from the earth's surface. The xmitter frequency was 960.05 megacycles and the power was 180 milliwatts.

This is a DX record!

—W6IIV

— 0 —

The Rats of the Twin Cities are planning a field day operation on the week-end of Aug. 22-23, 1959 utilizing only teleprinter gear. Our purpose in this operation is to try portable operation, learn field day problems, and gain experience operating from independent power sources.

We have purposely selected the above date so as not to conflict with any other week-end activity so as to minimize QRM, etc. We feel that this will enable us to pin-down specific problems without having them masked behind problems over which we have no control.

As you know F1 and A2 models of emission provide the most speedy and accurate method of handling emergency traffic. This is where our devoted group of RTTY men can really shine and prove to all that our branch of amateur radio is the best!

We are inviting your club to join us to provide as many stations as possible in the field. However if you are unable to join us in the field, we would appreciate it if you could work us on the above dates. More details as to exact time, procedure, etc. will be mailed as soon as we can line up RTTY men in the various sections.

BOB FINCKE, KØAKG

TO OUR READERS . . .

Please take a look at your name and address on this issue, you will note a date below the town and state. If it shows a date before current date, this will be last issue mailed you. Costs of printing the bulletin are too high to continue carrying subscription beyond expiration date.