

HAL DKB-2010 Dual Mode Keyboard

The HAL DKB-2010 dual mode keyboard is one of the most sophisticated products ever offered to the radio amateur. The perfect complement to the RVD-1005 visual display unit, the DKB-2010 is an all solid state keyboard that allows you to send either RTTY or CW with more ease and versatility than anything you've ever seen before.

RTTY Mode

In the RTTY mode, you can transmit at standard data rates of 60, 66, 75 or 100 WPM. 132 WPM is available on special order. Data rates are crystal controlled. Key functions provided are:

- | | |
|--|---------------|
| 10 Numeric | 26 Alphabetic |
| 2 Shift | 1 Break |
| 1 Space | 2 Manual |
| 15 Punctuation Marks and Bell | |
| 3 Carriage control: CR, LF, Blank | |
| 2 Three Character groups such as, CQ-, DX-, etc. | |
| 1 Identifier, which sends DE "call letters" and repeats. | |
| 1 "Quick Brown Fox" test message. | |

The three letter keys are programmed for two letter groups with a following space, as CQ or DX, or may be utilized for a 3 letter group if manual spacing is

used. The ID key sends DE followed by your call letters, and the test message sends "The quick brown fox jumps over the lazy dog's back 0123456789." Both the ID key and the test message key sequence repeat if the key is held down. An end of line indication is provided by an audio tone and a panel light when the 64th printing character is sent. Automatic case shift is provided so you type just as if you were using a typewriter. The output switching transistor is completely isolated from the rest of the DKB-2010, and is rated at 250 VDC, non-conducting, 80 ma conducting.

CW Mode

In the CW mode, the DKB-2010 operates at speeds between 8 and 60 WPM. Dot to space ratio (weight) is controlled digitally at weights of heavy (5:3), normal (1:1), light (3:5), and very light (1:7). Weights of (1:3) and (3:1) may also be selected in place of any of the four standard weights. Key functions provided are:

- | | |
|---|----------------------|
| 10 Numeric | 26 Alphabetic |
| 2 Shift | 1 Tune |
| 1 Word Space | 10 Punctuation Marks |
| 5 Special characters: <u>SK</u> , <u>AS</u> , <u>AR</u> , <u>KN</u> , <u>BT</u> | |
| 2 Three character groups, such as: CQ-, DX-, etc. | |
| 1 Identifier, which sends DE "call letters." | |

The identifier key performs the same function as described for the RTTY mode. RTTY only keys produce the Morse error code in the Morse mode. A monitor with adjustable volume and tone is provided. Output keying is provided for cathode (positive voltage to ground) or grid block (negative voltage to ground) lines. Ratings are +250 VDC non-conducting, 150 ma. conducting for cathode, and -150 VDC non-conducting, 150 ma. conducting for grid block.

Buffer Memory

Much of the operating convenience of the DKB-2010 is due to the buffer memory provided. A three character buffer is provided in the DKB-2010, and functions in both the RTTY and Morse modes. Three characters of buffer will allow most inexperienced typists to send flawless code. The buffer is particularly valuable on the Morse mode where the characters are of different length. Optional 64 and 128 key buffers are available, allowing much greater storage. These larger buffers may be loaded and dumped all at one time, or the code can flow through the buffer. Note that key functions, and not characters, are entered in buffer. The Buffer can hold 64 or 128 complete "Quick Brown Fox" test messages since the message is actuated by a single key. A light indicates when the buffer is full. N-key rollover is provided in both modes. This allows a new key to be pressed before the preceding key is released.

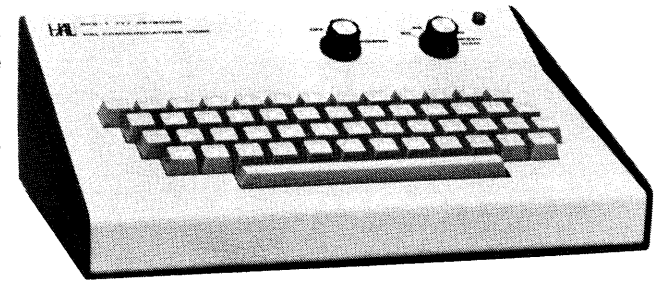
Construction

The DKB-2010 will be a rugged, as well as attractive addition to your station. Finished in two shades of gray, the wrinkle finish resists fingerprints. Key switches used in both modes have dark gray keytops. Only the best materials, such as glass epoxy PC boards, and computer grade keyswitches are used. PC board fingers are gold plated for maximum reliability. The DKB-2010 is available in assembled or kit form. The assembled unit carries the usual HAL 1 year warranty. The DKB-2010 has been carefully designed and engineered to make it possible to offer a kit. The same wiring harness used in the assembled unit is provided in the kit, greatly reducing the amount of work required to assemble the unit. Buffers are available assembled only. Power requirements of the DKB-2010 are 105-125 VAC, 125 ma or 210-250 VAC, 65 ma, at 47-440Hz. The size of the cabinet is 13½" wide by 9" deep by 5" high (rear), and the unit weighs 5 lbs.

Anyway you look at it — as a complete assembled unit, as an easy to build kit, as a RTTY keyboard, as a CW keyboard, the HAL DKB-2010 is a real breakthrough for every amateur. It adds a whole new dimension to the exciting world of amateur radio. Once you've used the DKB-2010, you'll wonder how you ever got along without it!

HAL RKB-1 TTY Keyboard

Used as a companion to the RVD-1002 Visual Display System or as a separate unit, the RKB-1 TTY Keyboard offers standard features found only on the most expensive mechanical key-



boards. The all-electronic character generating circuitry produces the Baudot code for alpha-numeric characters at the touch of the keys. But that's not all. . .

- You can select any of four operating speeds (60, 66, 75, or 100 WPM) with a single switch.
- You don't have to push a shift key when going from letters to numbers or vice-versa--the shift code is generated automatically. The keyboard layout is just like that of a standard typewriter, so teletype operation becomes just as easy as touch typing. A shift key is provided, too, for sending the less common punctuation marks.
- A unique circuit completely isolates the loop keying transistor from the other keyboard circuits. You can wire the keying transistor into any convenient point in your local loop.

The RKB-1 is carefully engineered to deliver years of service. High-quality commercial keyswitches with double-shot-molded keytops ensure long-term performance. Ganged in groups 4 or 5, these switches maintain perfect alignment and add rigidity to the circuit board on which they're mounted. The remaining components are mounted on a double-sided circuit board with plated-through holes for ease of soldering. Character coding is accomplished by the proven core-matrix method. The regulated logic power supply operates from either 115 or 230 V, 50 to 60 Hz AC.

The rugged but attractive two-tone grey cabinet has ample space for the optional KB-ID Keyboard Identifier described elsewhere in this catalog. Extra keyswitches are provided to actuate the identifier.

The RKB-1 is available as a kit or fully assembled. A one-year warranty against defects in materials and workmanship covers factory-assembled keyboards.

Once you've tried the RKB-1, it will quickly become your favorite. Combine it with the RVD-1005 Visual Display System and the Mainline ST-6 TU, and you'll have the most modern, most dependable RTTY system going. The equipment price list gives full details on ordering.



HAL ST-6 RTTY Terminal Unit

The Mainline ST-6, acclaimed by RTTY men for its immunity to interference and noise brings the reliability of all-solid-state circuitry to your station. Designed by Hoff (see *RTTY Journal*, September and October, 1970, and *Ham Radio*, January, 1971), the ST-6 is now available in either kit or assembled form from HAL. See April, 1973 *QST* for a complete review.

Autostart operation, an antispace feature, and switch selection of 850 and 170 Hz shifts are standard on the ST-6. All circuitry is contained on seven printed circuit cards. An extra discriminator for 425 Hz shift is available as an option.

The filters and discriminators in the ST-6 are designed for the standard RTTY tones: 2125 and 2295 Hz for 170 Hz shift and 2125 and 2975 Hz for 850 Hz shift. The optional discriminator for 425 Hz shift operates on tones of 2125 and 2450 Hz. The standard 850 Hz input filter is used for 425 Hz shift as well, making it unnecessary to change filters.

If you prefer to purchase the ST-6 factory assembled, you are assured of top quality workmanship and accurate alignment. The same high quality parts provided with the kit are used for the assembled version. Skilled professional personnel construct each unit and adjust the tuned circuits with an electronic counter to within 5 Hz for 850 Hz shift and 3 Hz for 170 Hz shift. Every unit is tested under actual operating conditions before it is shipped to you. Assembled ST-6's carry a one-year warranty against defects in parts and workmanship.

Factory assembled units are housed in the attractive cabinet shown in the photo, with all connectors and controls clearly marked. A front panel switch permits using the panel meter as a tuning indicator and as a loop current meter.

The ST-6 kit includes all parts except the cabinet. An attractive prepunched and lettered cabinet with rails punched to accept the card connectors is available as an option to simplify construction. The cabinet houses all seven circuit cards, with space to spare for the optional 425 Hz discriminator and AK-1 AFSK oscil-

lator. HAL supplies all parts needed to set up the low pass filter for either 60 wpm or 100 wpm.

The parts you receive are of the highest quality. Low-loss mylar "Orange Drop" capacitors for the tuned circuits, *new* 709 operational amplifiers, and predrilled G-10 epoxy-glass circuit cards ensure top performance and reliability.

Here are some of the other features that will make it easy for you to build and maintain the ST-6:

- The special-purpose power transformer saves space. It includes secondary windings for both the low-voltage and the loop supplies as well as a dual 115/230 volt 60 Hz primary.
- Dual-in-line (DIP) integrated circuits plug into sockets to make testing and replacement simple.
- The edge connectors have full-width gold-plated wiping contacts rather than the less reliable fork type.
- A 1 ma. panel meter serves as a tuning indicator and can be switched to read loop current. The meter mounts in a 1½" diameter hole.
- Separate neon pilot lamps indicate AC Power On, Mark, and Space conditions. Two low-current incandescent lamps in housings which match the neons show whether the unit is in receive or standby mode.
- A three-wire grounding power cord and a grounding outlet for the printer motor provide maximum safety.
- Clip-in fuses (rather than soldered-in types) mounted on the power supply card are easy to inspect and change if necessary.
- The toroids are supplied with all the hardware you will need to mount them.
- A comprehensive manual with circuit board layout drawings, schematics, pictorials, cabinet wiring diagrams, and photos of the completed boards helps prevent errors and makes it easy to assemble the kit. (The manual may be purchased separately for evaluation for \$10.00)

Whether you use the solid state system, or mechanical equipment, the best RTTY starts with the ST-6. Order yours today. You'll find complete ordering information in the equipment price list.

HAL ST-5 RTTY Terminal Unit

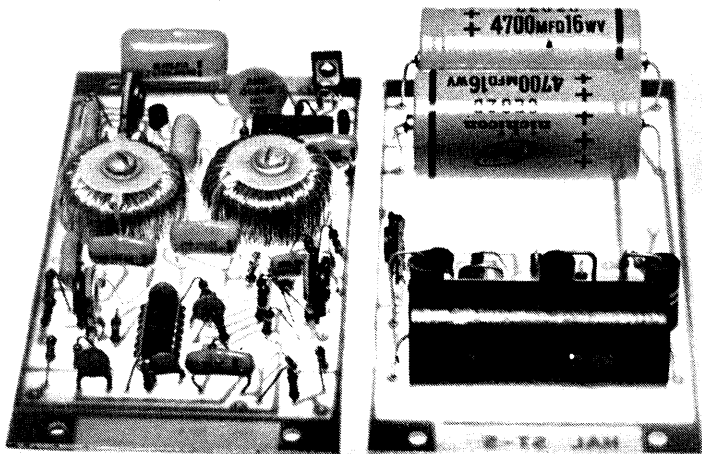
Solid reception at a budget price. . .the ST-5 kit will fill the bill if you're looking for consistently good performance from a relatively inexpensive, easy-to-build terminal unit. Like the ST-6, its "big brother", the ST-5 was designed by Hoff (see *RTTY Journal*, May, 1970, and *Ham Radio*, September, 1970, for full details).

The ST-5 kit includes many of the same high-quality components used in the ST-6. Two G-10 epoxy-glass printed circuit boards, each 2-7/8 by 5 1/4 inches, hold all the ST-5 circuitry, with the TU circuits on one board and the power supply on the other. The boards are predrilled and are designed to accept type 709 op amps in *either* metal TO-5 or plastic DIP packages. An instruction manual with layout drawings and schematics makes wiring the boards a simple task.

A single, custom-designed power transformer operates *both* the low-voltage supplies and the loop supply, saving weight and space. Zener regulators in the low-voltage supplies ensure stable operation despite power line fluctuations.

The entire ST-5 mounts in a 3 1/2 x 6 x 10 inch Bud Minibox (not furnished—if you cannot obtain one locally, HAL can supply one in grey hammertone). This cabinet will also house the ST-5 along with the AK-1 AFSK oscillator, and/or the ST-5AS autostart.

Order your ST-5 now. . .see the equipment price list for full ordering information.



HAL ST-5AS AUTOSTART KIT

With the new ST-5AS autostart adapter, you can add solid autostart reception to your ST-5 terminal unit at a budget price.

Patterned after the proven ST-6 autostart unit, the ST-5AS circuitry was described by Irv Hoff in the May-June, 1973 issue of *RTTY Journal*. It uses one operational amplifier and two transistors to provide both mark-hold operation and printer motor control.

The ST-5AS is easy to construct and install—it's simply a matter of assembling the printed circuit board and connecting it to the ST-5 demodulator and printer motor. Only a few minor modifications to the ST-5 are required. All autostart components except the motor control relay, switches, and connectors are mounted on a 2 1/2 by 3 1/2-inch glass-epoxy PC board. The board may be mounted in the ST-5 housing or in a separate cabinet (not furnished). The motor-control relay, the motor AC receptacle, and the autostart on-off switch mount on the cabinet. Power for the autostart circuit is taken from the ST-5's built-in supply. Each kit comes with a complete instruction manual which explains how to build, install, and use the ST-5AS.

Specifications:

Input "Trip" Voltage:	2.5 to 4.2 V (adjustable)
Autostart Bandwidth:	275 Hz minimum
Autostart Response Time:	2 to 4 seconds
Motor Dropout Time:	20 to 40 seconds
Relay Contact Rating:	120 VAC, 10 amp
Power Requirements:	+12 VDC regulated, 5 ma. -12 VDC regulated, 10 ma. -12 to -15 VDC, unreg., 115 ma.

For low-cost yet reliable autostart operation on HF SSB or VHF FM, the ST-5, ST-5AS, and the AK-1 AFSK oscillator make an ideal combination. Check the price list for ordering details.

HAL AK-1

AFSK Oscillator Kit

An easy-to-build AFSK oscillator with superior stability--that's the HAL AK-1. Designed as a plug-in accessory for the Mainline ST-6 terminal unit, the AK-1 is equally useful with the ST-5 or as a separate unit.

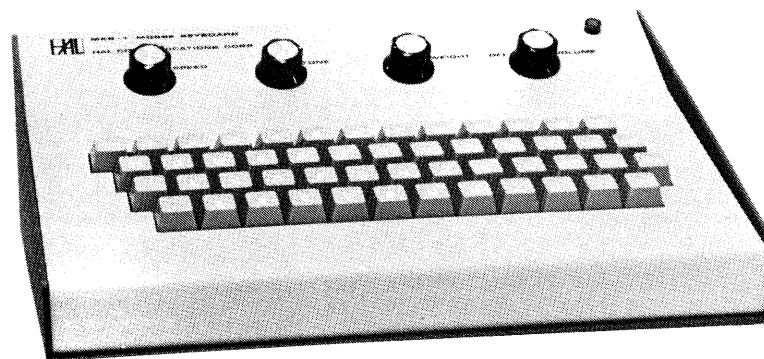
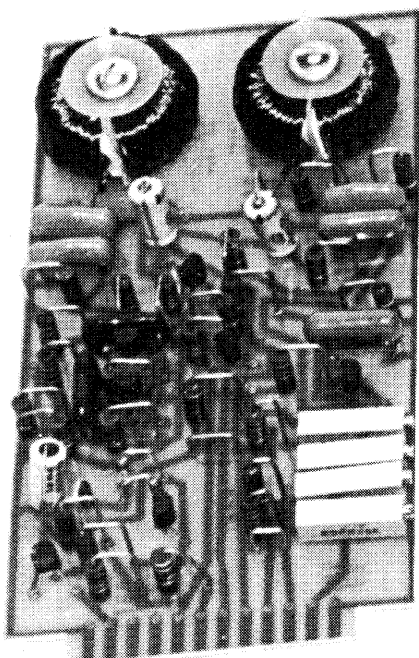
The circuit, described by Hoff in *QST* (February, 1969), provides switch selection of 170 Hz and 850 Hz shift using standard

AFSK tones. To make shift selection compatible with the ST-6, HAL has deleted the provision for special wide and narrow shifts. With the six-pole shift selector switch provided in the ST-6, you can change the terminal unit and AFSK oscillator shifts simultaneously. The AK-1 is compatible with the keying system used in both the ST-6 and the ST-5.

The AK-1 circuit board matches those in the ST-6. The 2-7/8 by 6 inch board is supplied with a 12-pin edge connector which fits right into predrilled holes on the ST-6 card connector rails. Or, if you prefer, you can easily mount the AK-1 in a separate cabinet for use as an independent unit. Frequencies are adjusted by 15-turn trimming pots mounted on the circuit board, reducing the number of wires to external components and aiding in accurate adjustment of the tones.

The AK-1 operates on +12 VDC at 50 ma.; it can normally be powered directly from the ST-6 or ST-5 power supply. The kit comes complete with the circuit board, the edge connector, the audio output connector, and all components.

AFSK has never been easier or more convenient to operate. For HF or VHF AFSK, you can't beat the AK-1. Order yours today. See the equipment price list for ordering information.



HAL MKB-1 Morse Keyboard Codetyper

If you're a CW man who wants more fun from his mode, consider the MKB-1, a complete Morse keyboard codetyper, available either as a kit or fully assembled. If you've never used a codetyper, a new world of operating ease awaits you. Touch the keys--just like those of a standard typewriter--and you send perfect code effortlessly. Here are some of the advanced features you'll find in the MKB-1:

- Code speed is variable from 10 to 60 WPM
- Weight (dot-to-space ratio) is adjustable and is not affected by speed changes.
- A monitor oscillator, with variable volume and tone, drives an internal speaker or an external audio system--ideal for group code lessons.
- The internal transmitter keying transistor can be used for grid-block keying (up to -150 V at 150 ma.) or cathode keying (250 V at 150 ma.).

The MKB-1 is designed with the engineering skill and high-quality components you've come to expect from HAL. The dependable TTL logic circuitry, which contributes to the unit's compactness and light weight, is constructed on a 3 by 6 inch double-sided circuit board. Plated-through holes make soldering easy.

The keyboard assembly uses reliable commercial keyswitches with durable double-shot-molded keytops. The switches are encased in groups of 4 or 5, ensuring perfect key alignment and adding to the rigidity of the PC board on which they mount. The proven core matrix technique is used for character coding. Extra keyswitches are provided to actuate the optional KB-ID identifier.

The KB-ID, which automatically transmits your station call, mounts in the MKB-1 cabinet. The identifier is described separately in this catalog.

The MKB-1 comes complete with all circuitry and components, the keyboard assembly, and an attractive sloping-panel cabinet. The internal power supply operates from either 115 or 230 volts AC, 50 to 60 Hz. HAL's one-year warranty against defects in materials and workmanship covers all factory-assembled keyboards.

Now's the time to move up to codetyper convenience and accuracy. See the equipment price list for full ordering information.

KB-ID Automatic Identifier

An accessory for the MKB-1 keyboard, the KB-ID automatically transmits the letters "DE" followed by your station call at a touch of the keyboard ID key. Hold the key down and your call repeats (without the "DE" prefix) until you release it.

The identifier memory has ample storage capacity for any amateur call sign plus the portable designator, "/ number". When you're operating from your fixed station, just throw a toggle switch and the portable designator is deleted.

Two other keys activate still another identifier feature. Each one may be programmed to transmit any group of two characters followed by a space. For example, you could code one of the keys to send "73". The following space is produced automatically. Or if you prefer, you can eliminate the space and substitute a third character. As with the ID message, the character group repeats as long as the key is held down. All functions are self-completing and the keys are locked out while the message is being sent.

The MKB-1 keyboard codetypers come equipped with three extra keyswitches for the identifier functions. Cabinet space is reserved for mounting the identifier, which is constructed on a 3 x 4 inch G10 circuit board with plated-through holes for ease of assembly. The identifier operates from the keyboard power supply.

The KB-ID can also be used with the W4UX Touchcoder II formerly produced by HAL. It may be necessary to provide a separate identifier power supply.

The KB-ID is available as a kit, or, if you order it with an assembled MKB-1, HAL engineers will wire, install, and test it before your keyboard is shipped. On assembled units, HAL will also precode the identifier memory with the messages of your choice. Be sure to specify the call (complete with the portable designator) and the other two character groups you'd like. Consult the equipment price list for additional ordering information.



HAL 2550 Electronic Keyer

Incorporating all the advanced features of previous HAL keyers *plus* an optional new automatic identifier, the HAL 2550 brings you greater performance, appearance, and value than any other keyer. The 2550 retains the primary characteristics of being extremely easy to use. Some of the features which contribute to this ease of operation are:

- * A triggered clock pulse generator. This insures that the first dot or dash is no longer or shorter than those that follow. The first character starts the instant you push the key—there's no change for the delay often encountered in keyers with free running pulse generators.
- * Iambic (squeeze) keying. A string of alternate dots and dashes are produced when both levers of a squeeze paddle are closed. All alphanumeric characters except P and X may be sent with a single squeeze of the paddle. Single lever paddles may also be used, but without the advantage of squeeze keying.
- * Dot memory. A dot may be entered before the preceding dash is completed. The keyer finishes the dash, inserts a space, and sends the stored dot. Dots, dashes, and spaces are self-completing.

Other features allowing increased pleasure and flexibility of operation are:

- * Sidetone monitor. A powerful monitor has variable volume and tone (internal) controls. Audio is available at a rear panel jack for mixing with receiver audio or driving an external amplifier. The internal speaker is disconnected when using the audio output jack.
- * Transistor switch. A rugged transistor switch is provided for grid block or cathode keying.

- * Tune position: Tune capability is provided by front panel switch or through the rear panel handkey jack.
- * Operation from 105-125 VAC, 50-60 Hz or 12 VDC, 400 ma. is standard. 210-250 VAC is also available as an option. A regulated power supply is used.
- * One year warranty.

2550 Keyer ID Option

A new, more flexible ID option is available in the 2550 keyer. The ID coding is contained in a programmed read only memory (PROM). The PROM plugs into a socket allowing *easy* program change for contests and other activities. The PROM is divided into two sections, each having a code capacity of 62 dots, dashed and spaces. Each section is actuated by a switch closure to ground, and if the ID active line is held grounded, the message will repeat. If both ID lines are held closed, the messages will repeat alternately. This will allow alternate repetition of a message in the form CQ FD CQ FD (programmed in the first section of the PROM) and DE WB9XYZ/9 K (programmed in the second section of the PROM). When counting your message length, allow just one location for each dot, dash, and intercharacter space, and 3 locations for each interword space. Specify coding for first and all extra PROM ICs.

Specifications

Speed Range:	5 – 60 WPM
Monitor:	Variable volume and tone (internal control), internal speaker, rear panel audio output.
Keyed Switch:	–150 V, 150 ma for grid block keying, +250 V, 150 ma for cathode keying.
Front Panel Controls:	Speed (tune in extreme counter clockwise position); Sidetone volume (power off-on switch).
Rear Panel:	Line cord, fuse, ground screw, keyed output, audio output, handkey input, paddle input, ID key inputs, DC input.
Power Requirements:	105–125 VAC 50–60 Hz, or 12 VDC, 400 ma. (210–250 VAC 50–60 Hz available as an option).
Finish:	Anodized aluminum front panel, grey crackle finish cabinet.
Size & Weight:	6½" W x 3½" H x 6" D, 3½ lbs.

Order the 2550 keyer now, and you'll have the operating convenience and reliable performance you've been looking for in an electronic keyer.



HAL ID-1A Repeater Identifier

The ID-1A makes it simple to operate your FM repeater in compliance with FCC identification requirements. For either commercial or amateur service, the ID-1A offers features you'll find hard to match:

- The identification message is stored in a diode-matrix read-only memory (ROM) having a capacity of 39 dots, dashes, and spaces--enough for "DE" plus any amateur call sign. The unique memory design requires an unusually low number of diodes. You can readily reprogram it yourself without having to be a computer genius.
- The interval between ID's is accurately timed by the power line frequency or an internal oscillator. You can select nominal intervals of 3, 6, 12, or 24 minutes. There's no continuous code stream in the background to distract repeater users.
- A rugged transistor switch, rated to handle $\pm 28V$ at 500 ma., actuates the transmitter keying relay or other system controller.
- Code speed is adjustable. The keyed audio oscillator, complete with tone and volume controls, has a low output impedance for driving the transmitter microphone line and a 2" monitor speaker.
- The built-in regulated power supply operates from 115 VAC, or from an external 12 VDC, 300 ma. source for emergency service. When operating from a DC source, an internal oscillator drives the timing circuits.

Here's how the identifier works: When the repeater is keyed up, a switch closure to ground actuates the ID-1A, and the station call is sent immediately. If the repeater is used again within the next three-minute interval, the call sign will be retransmitted three minutes after the initial identification. Although the repeater may be off the air at the moment, the identifier keys it up to transmit the call. As long as the repeater is used at least once during each succeeding three-minute period, the call will be transmitted at the desired intervals.

If, however, the initial key up was caused by a noise burst or a short call to which there was no response and if the repeater then remains inactive for the next three minutes, the call sign will not be sent again. To protect against noise triggering, the identifier will ignore any key ups occurring within five seconds after the initial identification has been completed.

The timing interval is determined by a frequency divider which counts the power line frequency. For amateur use, it counts to a total of 10,240 cycles, corresponding to an interval of 2 minutes, 50.67 seconds. Dividing primarily by factors of two, the divider chain uses a minimum number of IC's. The time interval is close enough to three minutes to satisfy the proposed FCC requirements.

For commercial service, the timing interval can be increased to 2, 4, or 8 times the normal length by moving a jumper wire on the circuit board. Also of special value to commercial users is the paging control feature. Holding the paging control line at ground will delay transmission of the call sign until the line is released.

All circuits, including the power supply, are factory assembled on a 3 x 6 inch double-sided G10 circuit board. Also supplied are those components which mount external to the board: the power transformer, speaker, fuseholder, and connectors for the keying line input, audio output, and transistor switch output.

The ID-1A is also available fully assembled in a 1½-inch high rack-mounting cabinet. Avoid citation. See the equipment price list for information on ordering either version.

HAL W3EFG SSTV Camera Scan Converter

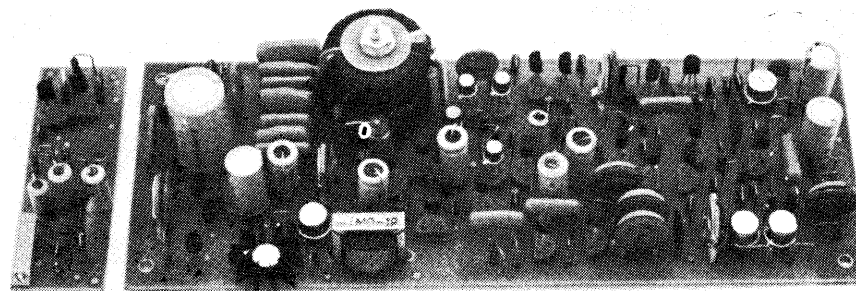
Fascinated by amateur TV? Then this scan converter kit is for you. Designed by W3EFG and described in the July, 1971, issue of *Ham Radio*, this circuit samples the video signal from a regular fast-scan TV camera and generates a slow-scan audio-frequency signal you can feed to a single-sideband transmitter. The tested and proven converter circuit delivers an excellent picture with high resolution and contrast.

The kit includes all the circuitry you need to convert your fast-scan camera, whether it's a tube or transistor type, commercial or homebrew. The scan converter circuits and a regulated power supply fit on a single 3 x 8 inch PC board. A second board, 1 x 3 inches, holds the circuit which divides the camera's vertical frame rate down from 60 to 15 Hz for slow-scan work. It mounts inside the camera and is equipped with a toggle switch so that you change the camera back instantly to normal fast-scan operation.

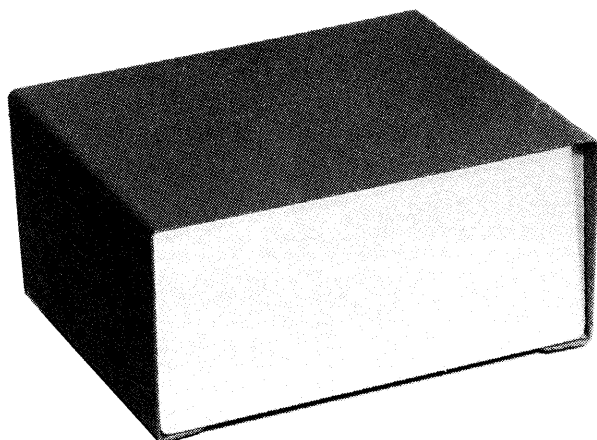
Both G10 epoxy-glass circuit boards are etched and predrilled, ready for you to assemble. They're designed so that you can use transistor sockets (not furnished) if you wish. You receive all parts including connectors; all you need to supply is the cabinet (a 3½ x 6 x 8 inch Bud Minibox is perfect) and a few hours of your time.

To reduce your cost, HAL engineers have made substitutions for some parts specified in the original design. All such changes have been tested and approved by W3EFG. Instructions for building and installing the converter are packed with the kit.

Get into slow scan fast. . .the equipment price list tells how to order.



HAL
DESIGNER
CABINET
\$5.50 ppd



For your small construction projects, here's an attractive, rugged steel and aluminum unpunched cabinet. Approximately 3" x 6" x 4" in size, it is the same cabinet which houses the 1550 keyer. The top is steel, painted grey wrinkle; the bottom is black anodized aluminum. A brushed aluminum front panel with adhesive backing and four rubber feet is supplied. Order the HAL Designer cabinet. 3 lbs. shipping weight.

HAL BROADBAND DOUBLE-BALANCED MODULATOR KIT \$6.50 ppd

Product detector, frequency convertor, balanced modulator, phase detector, current-controlled attenuator. . . These are just a few of the ways you can use the HAL double-balanced modulator. The circuit, described in the March, 1970, issue of *Ham Radio*, uses matched hot carrier diodes and top quality toroidal cores to achieve high port-to-port isolation, wide dynamic range, good noise figure, and low distortion.

Here's what the kit includes:

- A 7/8 x 2 inch G10 epoxy-glass PC board
- Four HP2800 hot carrier diodes matched to within 10 mv. over a current range from 0.5 to 5 ma.
- Two Indiana General CF102-Q1 toroidal cores, and wire.
- Complete assembly instructions

EQUIPMENT LIST (All prices postpaid)

			AIR MAIL & UPS BLUE
RVD-1005T	Assembled (Table Top Cabinet)	\$575.00	\$10.00
RVD-1005R	Assembled (Rack Cabinet)	575.00	10.00
RVD-1005	Manual for evaluation purposes	10.00	1.00
RVD-2110	Television receiver/video monitor	150.00	10.00
DKB-2010	Assembled	425.00	10.00
DKB-2010	Kit Form	325.00	10.00
DKB-2010	128 key buffer	150.00	1.00
DKB-2010	64 key buffer	100.00	1.00
DKB-2010	Manual for evaluation purposes	10.00	1.00
RKB-1	Assembled	250.00	5.00
ST-6T	Assembled, Table Cabinet	310.00	10.00
ST-6R	Assembled, Rack Cabinet	310.00	10.00
	Includes 170/850 Hz shift, auto start, antispace. Low pass filter will be set for 100 WPM unless specified otherwise.		
ST-6T or R	with AK-1 assembled	350.00	10.00
ST-6T or R	with 425 Hz shift, assembled	350.00	10.00
ST-6T or R	with AK-1 and 425 Hz shift, assembled	390.00	10.00
ST-6	Manual for evaluation purposes	10.00	1.00
ST-6	Kit form, with boards, less cabinet	147.50	4.00
ST-6 T or R	Cabinet (specify table or rack)	35.00	4.00
ST-6	Boards and manual	22.50	1.00
ST-6	425 Hz shift, kit form	29.00	1.00
ST-5	Kit form (cabinet excluded)	55.00	3.00
ST-5	Boards and manuals	10.00	1.00
ST-5AS	Autostart Kit	17.50	1.00
ST-5AS	Board and manual	5.00	1.00
AK-1	Kit form	29.00	1.00
AK-1	Board and manual	5.00	1.00
MKB-1	Assembled	250.00	5.00
MKB-1/KB-ID	Assembled (specify call)	290.00	5.00
MKB-1	Kit form	170.00	5.00
KB-ID	Kit form	29.00	1.00
2550/ID	Assembled (specify PROM)	125.00	3.00
2550	Assembled	95.00	3.00
2550/PROM IC	Specify coding for first and all extra PROM IC's	10.00	—
ID-1A	Assembled in rack cabinet	115.00	3.00
ID-1A	Assembled circuit board, no cabinet	75.00	2.00
	Specify call, timer length, and any other special requirements.		
W3EFG SSTV	Kit form	60.00	3.00
W3EFG SSTV	Boards and manual	7.50	1.00
ARRL FM TX	Board and manual	7.50	1.00
Bud box for ST-5/AK-1/ST-5AS & SSTV		4.00	1.00

System Discount

When ordering the assembled ST-6 (and options), assembled DKB-2010 (and options), and RVD-1005, a 3% system discount may be taken. A 3% discount may also be taken on any other equipment ordered at the same time. System discount applies only to orders placed with remittance. Sorry, no discount possible on charge card orders.

INTEGRATED CIRCUIT TYPE AND PRICE LIST

DIGITAL

TTL (DIP PACKAGE)

7400	4-2 input NAND	\$.40	7442	4-10 line decoder	\$2.00
7401	4-2 input NAND, open collector	.40	7445	4-10 line decoder	3.00
7402	4-2 input NOR	.40	7472	1-Master-slave J-K FF	.60
7404	6-inverter	.50	7473	2-Master-slave J-K FF	.90
7405	6 - inverter, open collector	.50	7474	2-D type FF	.90
7410	3-3 input NAND	.40	7475	4 - latch	1.30
7420	2-4 input NAND	.40	7486	Quad exclusive OR	.85
7430	1-8 input NAND	.40	7490	Decode Counter	1.25
7440	2-4 input Buffer	.40	7492	4 bit hexadecimal counter	1.25
7441	4-10 line decoder/ Nixie Driver	3.00	7493	4 bit binary counter	1.25
			7495	4 bit L-R shift register	2.00
			7496	5 bit parallel in shift register	2.00
			74121	mono stable multivibrator	1.00

LINEAR

702L	General Purpose Operational Amplifier	\$1.30
709L	High Performance Operational Amplifier	1.25
709N	High Performance Operational Amplifier	.75
710N	Differential Voltage Comparator	1.25
724	General Purpose Operational Amplifier	9.00
724N	General Purpose Operational Amplifier	6.00
724L	General Purpose Operational Amplifier	9.00
741V	Compensated Operational Amplifier	1.00
MC1496G	Balanced Modulator-Demodulator	3.25
MC1590G	Wide Band Amplifier with AGC	5.60
LM1458N	Dual 741 Operational Amplifier	1.75

SPECIAL INTEGRATED CIRCUITS

NE565A	Phase Lock Loop	7.50
NE567V	Phase Lock Tone Decoder	7.50
FCD-180(V)	Electro-Optical Isolator	2.55

P, A, N indicates dual inline 14 pin package

G, L indicates T05 type package

V indicates dual inline 8 pin package

See page 31 for shipping charges.

GENERAL PURPOSE AND HARD TO FIND ITEMS

The devices listed below have been selected to satisfy most of your construction needs. They will serve as substitutes for a wide variety of diode and transistor types. Also stocked for your convenience are several hard to find items, such as the phase-locked loop IC's. See page 31 for shipping charges.

TRANSISTORS

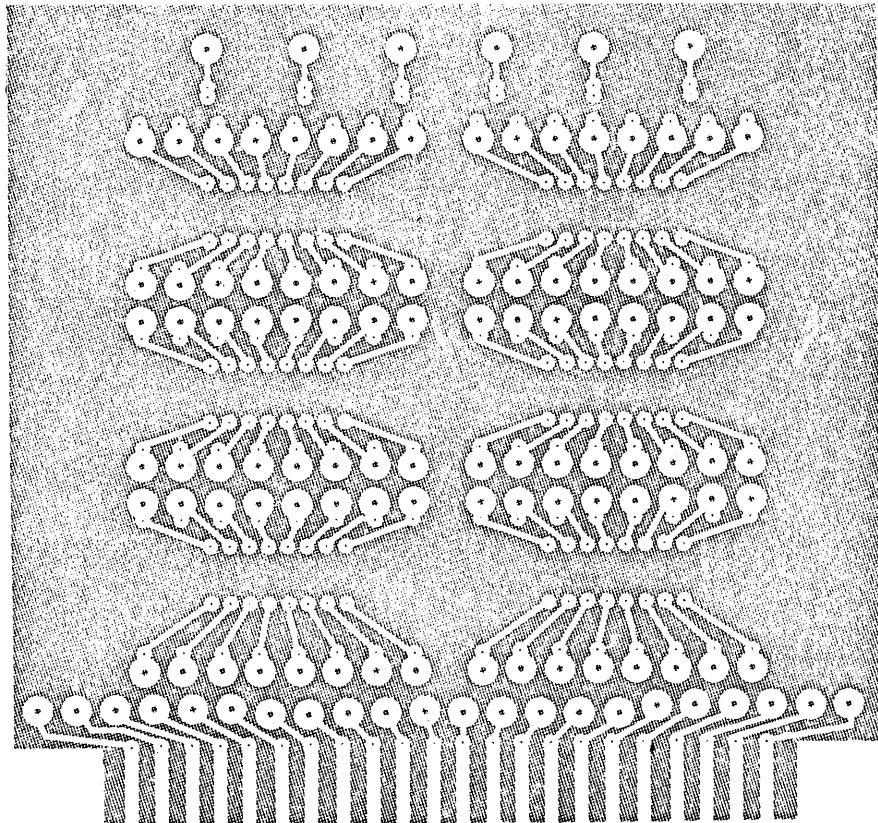
2N697	Med. gain NPN	\$.50
MPS3394	Med. gain NPN	.30
MPS3395	High gain NPN	.50
MPS3703	Med. gain PNP	.40
MPS6518	High gain PNP	.65
2N918	OSC or high freq. amp.	.75
40637	OSC or high freq. amp.	1.00
2N3866	RF amp. to 400 MHz	1.75
2N5913	RF amp. to 400 MHz	3.60
2N3819	General purpose JFET	.60
MPF102	General purpose JFET	.60
2N5486	VHF JFET	1.00
E300	VHF JFET (epoxy 2N5397)	1.40
40673	VHF Dual gate protected MOSFET	1.00
2N5655	High voltage NPN (250v)	1.00
2N5401	High voltage PNP (150v)	1.00
MJE521	Med. gain NPN power	1.50
MJE370	Med. gain PNP power	1.50
2N3055	High power NPN	1.50
2N4871	Unijunction	.75
MU4892	Unijunction	1.25
2N5062	Low power SCR (Thyristor)	1.00

DIODES

1N270	Germanium Signal	.20
1N4148	Silicon Signal	.20
1N4005	600 PIV, 1A rectifier	.20
1N47xx series	Zener Diodes 3.6, 5.1, 6.8, 8.2, 9.1, 12v	.75
MV839	Varactor	1.35
MV2101	Varactor	.90
HP2800	Hot Carrier Diode	.90
HP2800Q	4 matched Hot Carrier Diodes	4/4.25

LINEAR INTEGRATED CIRCUITS

N565A	Phase Lock Loop	7.50
N567V	Phase Lock Loop Tone Decoder	7.50
MC1496G	Balance Modulator-Demodulator	3.25
MC1590G	Wide Band Amplifier with AGC	5.60
709N	Operational Amplifier	.75
741V	Compensated Operational Amplifier	1.00
FCD-810	Electro-Optical Isolator	2.55



HAL BREADBOARD CARD
FOR DIP IC'S \$5.50

This etched and drilled 1/16" G10 epoxy glass card provides mounting locations for 6 DIP integrated circuits. Each pin of the IC is brought out to two pads drilled #60 for wire connections. Molex Soldercon plug-in IC sockets are furnished so that the IC's may be plugged in rather than soldered in. The card size is 4 1/4" by 4 1/4" and it plugs into a standard 22 pin edge connector (.156" finger spacing).

EDGE CONNECTORS

22 pin, double readout solder tail	\$3.00
22 pin, double readout PC mounting	3.00
12 pin, solder tails	1.75

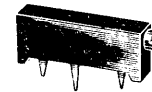
RESISTORS Stable low noise deposited carbon or standard carbon composition.

1/2 watt, 10%, 1 ohm - 10 megohm
1/4 watt, 10%, 1 ohm - 1 megohm
Only 6¢ each: 50¢ for ten of your choice;
\$4.50 for 100, any mixture,

1	10	100	1.0K	10K	100K	1.0M
1.2	12	120	1.2K	12K	120K	1.2M
1.5	15	150	1.5K	15K	150K	1.5M
1.8	18	180	1.8K	18K	180K	1.8M
2.2	22	220	2.2K	22K	220K	2.2M
2.7	27	270	2.7K	27K	270K	2.7M
3.3	33	330	3.3K	33K	330K	3.3M
4.7	47	470	4.7K	47K	470K	4.7M
5.6	56	560	5.6K	56K	560K	5.6M
6.8	68	680	6.8K	68K	680K	6.8M
8.2	82	820	8.2K	82K	820K	8.2M
						10.0M



ST-5 loop resistor	2750 ohm/20W	\$1.00
ST-6 loop rheostat	2500 ohm/20W	2.00



HELIPOT 89PR SERIES	15 TURN POT	1.50
1K, 10K, 25K, 200K ohms		

TRIMPOTS	PC Board Mount	1/4 watt	.50
500 ohm	vertical mount		
1K ohm	vertical mount		
2.5K ohm	vertical mount		
5K ohm	vertical mount		
10K ohm	vertical mount		
25K ohm	vertical mount		
50K ohm	vertical mount		
100K ohm	vertical mount		



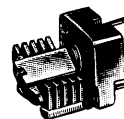
PANEL MOUNT POTENTIOMETERS			
500 ohm	linear taper		\$1.00
1K ohm	linear taper		1.00
5K ohm	linear taper		1.00
25K ohm	linear taper		1.00
1.5K ohm	reverse log taper		2.00
50K ohm	reverse log taper		2.00
500 ohm	linear taper w/switch		1.50
1K ohm	linear taper w/switch		1.50



88 mhy	Toroid	surplus	\$5/\$4.00
Nylon washers, for mounting toroids			10/.50
Delbert Blinn Toroid Retainer			.25

CAPACITORS, VARIABLE

E.F. Johnson 189-505-5	1.7-14.1 pf	.65
Arco 3-140	pf ceramic paddler	.25

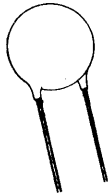


CAPACITORS

See page 31 for shipping charges.

Ceramic Disc

3 pf, 500 volts	\$.15	1000 pf, 1000 volts	\$.25
15 pf, 500 volts	.15	3000 pf, 500 volts	.25
47 pf, 500 volts	.15	5000 pf, 50 volts	.25
82 pf, 500 volts	.15	.01 uf, 50 volts	.25
100 pf, 500 volts	.15	.02 uf, 50 volts	.25
220 pf, 500 volts	.15	.05 uf, 50 volts	.25
270 pf, 500 volts	.15	.1 uf, 25 volts	.40
390 pf, 500 volts	.15	.22 uf, 12 volts	.40
500 pf, 500 volts	.15		



Silver Mica

5 pf, 5%	\$.25	82 pf, 5%	\$.25
15 pf, 5%	.25	120 pf, 5%	.25
27 pf, 5%	.25	330 pf, 5%	.25
47 pf, 5%	.25	680 pf, 5%	.25



Polystyrene

4700 pf, 5%	\$.25	10000 pf, 5%	\$.25
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Sprague Orange Drop

.01 uf, 100 volts	\$.25	.039 uf, 100 volts	\$.25
.012 uf, 100 volts	.25	.047 uf, 100 volts	.25
.015 uf, 100 volts	.25	.056 uf, 100 volts	.25
.018 uf, 100 volts	.25	.068 uf, 100 volts	.25
.02 uf, 400 volts	.25	.1 uf, 100 volts	.30
.022 uf, 100 volts	.25	.15 uf, 100 volts	.30
.027 uf, 100 volts	.25	.18 uf, 100 volts	.30
.033 uf, 100 volts	.25	.68 uf, 100 volts	.75



Electrolytic, axial leads

2.2 uf, 16 volts	\$.35	100 uf, 250 volts	\$1.50
4.7 uf, 16 volts	.35	150 uf, 16 volts	.90
10 uf, 16 volts	.35	350 uf, 16 volts	1.00
22 uf, 16 volts	.35	500 uf, 25 volts	.15
47 uf, 16 volts	.35	4700 uf, 15 volts	2.75



Electrolytic, parallel leads

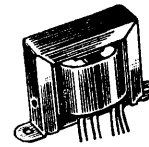
47 uf, 16 volts	\$.40	1000 uf, 16 volts	\$.75
100 uf, 25 volts	.45	1000 uf, 25 volts	.90
220 uf, 16 volts	.50		



Computer Grade Electrolytic 1000 uf/450 v 1.25

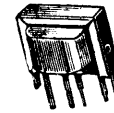
TRANSFORMERS:

Stancor P6465, Filament or low voltage supply 115 vac primary, 6.3v, 600 ma secondary	\$2.00
Stancor P6375, Filament or low voltage supply Dual 115/230 VAC primary Dual secondary, 6.0v/2A or 12.0VCT/1A	\$4.00
Stancor P8358, Filament or low voltage supply 115VAC primary, 12.6 VCT/3A secondary	\$5.00
HAL ST-6 RTTY TU Transformer 115/230VAC, 50-60 Hz primary 250 VCT, 60 Ma secondary for loop supply 28 VCT, 500 Ma secondary for LV supply	\$8.00 \$10.00



Miniature Audio Transformers, PC mount

500 ohms-8 ohms	\$1.00
10K ohms-2K ohms	1.00



INDIANA GENERAL TOROIDAL CORES

CF 102-06 Useful to 500 KHz	.50
CF 101-Q1 Useful to 20 MHz	.50
CF 101-Q2 Useful to 50 MHz	.50
CF 102-Q3 Useful to 225 MHz	1.25
Note: CF 101 -- .230"OD, .120" ID, .060" Thick	
CF 102 -- .375"OD, .187" ID, .125" Thick	



FERRITE BEADS Ferroxcube Same as Amidon 10/1.00

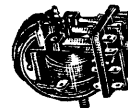
SWITCHES

Mini Toggle (Imported) SPST	\$1.25
Mini-toggle (Imported) SPDT	1.35
Mini-toggle (Imported) DPDT	1.50
Standard toggle (Imported) SPST	.75
Standard toggle (Imported) DPDT	.80
Centralab PA 2002 2P6T	2.75
Centralab PA 1002 2P4T	2.00
Centralab PA 1018 6P3T (ST-6 3 shift)	3.00
Imported 6P2T (ST-6 2 shift, power)	1.25



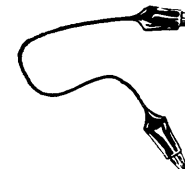
RELAYS: Open frame, DPDT 10 A contacts




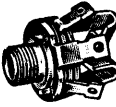

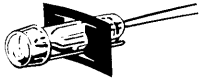

12 VDC	\$3.50
24 VDC	3.50




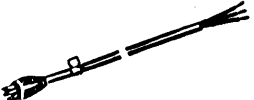

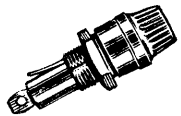

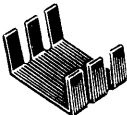
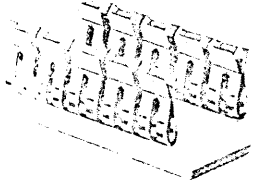
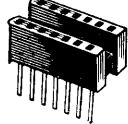

JUMPER SET, A must for the hobbyist

10 jumpers, each 14" long, 5 assorted colors	1.50
Miniature alligator clips	



	PLUGS AND JACKS	
	Phono plugs, Switchcraft 3501M	10/1.00
	Phono jack, Switchcraft 3501FP	.30
	Phone plug, 1/4 inch (Imported)	
	Two circuit (Stereo)	.60
	Single circuit	.50
	Phone jack, 1/4 inch	
	Two circuit (stereo), Switchcraft 12B	.75
	Single circuit, Switchcraft 12A, closed circuit	.65
	Strain Relief, AC Line Cord	10/1.00
	Angle Bracket (7/8" x 7/8")	10/1.00
	Insulating hardware 3/8" ID	per set, .25
	For standard 1/4" phone jack	
	One flat fibre washer	
	One shoulder fibre washer	
	Terminal Strip (6,7, or 8 lug)	5/1.00
	INDICATOR LAMPS	
	Ne2 Neon Lamp	.15
	Complete Neon Lamp Assembly	.35
	Ne2 lamp, current limiting resistor	
	Speed nut, red plastic lens	
	Incandescent Lamp Assembly	1.00
	28 volt, 40 ma (12 volt, 25 ma)	
	Speed nut, Red plastic lens	
	Same style as the neon assembly above	
	KNOBS	
	Kurz Kasch 1" diameter, 1/4" shaft	.75
	Black with silver insert	

See page 31 for shipping charges.

	METER 0-1 ma	97.50
	Face 1-13/16 x 2-3/8"	\$ 10.00
	Mounts in 1 1/2" hole	
	Belden 17237-SVT Line Cord	1.25
	2 conductor with ground	
	Grey vinyl, 6' long, #18 conductors	
	Amphenol 160-2N	1.50
	AC Connector, female	
	Two conductor with ground	
	Fuse Holder Buss HKP	.50
	Standard Panel Mount	
	For 3AG Fuse	
	Fuse Clips, for 1/4" diameter fuses	10 for .50
	Heat Sinks	
	Wakefield NF203 for TO-18 case	.40
	NF207 for TO-5 case	.40
	Thermalloy 6107B14 For Thermopad Case	.30
	IC SOCKETS	
	Molex Soldercon® IC Sockets 14 pin socket	.25
	Strips of terminal pins for PC board use	
	7 pin strips; mount in place and break carrier	
	Cinch 14 Pin Dual Inline Socket	.60
	16 Pin Dual Inline Socket	.75
	10 Pin TO-5 Socket	.75
	8 Pin TO-5 Socket	.60
	CRYSTAL SOCKETS	
	AUGAT Horizontal PC Mount for HC-6u	.50
	INT. CRYSTAL, PC MOUNT for HC-18/u	.20
	INT. CRYSTAL, PC MOUNT for HC-6/u	.20

See page 31 for shipping charges.

ORDERING INFORMATION

Our prices include the cost of shipping charges for UPS or parcel post shipment. If air mail shipment is desired, an extra amount must be submitted.

Prices shown in this catalog supercede those in all previous catalogs or advertisements. All prices and specifications are subject to change without prior notice.

ROUTING

Small packages of semiconductors and components (less than 1 lb.) which do not require insurance will be sent via first class mail.

Packages which weigh more than 1 lb. and/or require insurance will be sent via UPS if possible, or via parcel post. UPS is preferred due to lower rates, faster delivery, and traceability of shipment. UPS shipments can be made to addresses with ZIP CODE 010-799, and to California, Oregon, and Washington (excluding APO-FPO addresses). PLEASE use a street address, even if you have no home mail delivery. UPS service to the west coast is air service.

Merchandise valued over \$200.00 cannot be shipped via parcel post due to insurance limitations. If you are not served by UPS, registered airmail is the next best choice for shipments valued over \$200.00. Insurance charges will be added as required.

Use the information under SHIPPING CHARGES to figure the amount needed for shipping. We will refund excess over \$1.00 automatically by check, and amounts less than \$1.00 upon request. You may also send an open limited check and we will fill it in for the exact amount. Remittance may be made by personal check, certified check, or money order.

Telephone COD, Bank Americard, and Mastercharge orders are accepted. Please give us all information in raised letters on your card.

All foreign orders, including Canadian orders must have adequate allowance for postage, and the remittance should be in US funds (bank check or international money order). We will be happy to quote the exact amount to be remitted on foreign orders.

Thank you for your interest in our products. We look forward to serving you.

SHIPPING AND HANDLING CHARGES

EQUIPMENT

All equipment prices on page 21, and those on page 20 include shipping for parcel post shipment and UPS ground shipment in the continental United States. UPS service to California, Washington and Oregon is air service.

Parcel post or UPS No charge

Air Mail as shown on page 21

PARTS ORDERS

Up to \$10.00 \$1.25
 \$10.00 - \$25.00 \$1.75
 \$25.01 up \$2.25

All shipments are FOB Urbana, Illinois. This means we are not responsible for them after the shipment is given to the post office or other carrier. For this reason, we urge you to remit insurance and registered mail fees as shown in the table below. COD charges as shown should be remitted if you request COD shipment. Postal COD fees include insurance.

INSURANCE, REGISTERED MAIL AND COD FEES

VALUE UP TO	UPS		MAIL	
	INS.	COD	INS. REG.*	COD
\$ 5085	.30	.90
10085	.40	1.00
150	.25	.85	.50	1.10
200	.25	.85	.60	1.10
300	.50	.85	1.55*	1.25
400	.75	.85	1.55*	NA
500	1.00	.85	1.85*	NA
600	1.25	.85	1.85*	NA

↑
\$1.00

- * Operation at 60, 66, 75 and 100 WPM
- * Manual line feed and letters shift controls
- * Selectable letters-shift-on-space control
- * Automatic carriage return—line feed on line feed ("non over-print")

New features are

- * Display format of 25 lines, 40 characters per line
- * Automatic carriage return—line feed on space when space is received after the 34th character. Prevents splitting of short words
- * Speed indicator. The speed indicator times the incoming signal and causes an LED to light, showing the operator which speed switch to select. Especially helpful in tuning unknown commercial stations.

How it Works

What does the RVD-1005 do? Basically, it stores the incoming characters from your terminal unit, decodes them, and generates a video signal which is fed to the monitor. Each character is produced by a matrix of dots on the monitor screen, as the photo shows.

The RVD-1005 can display up to 1000 characters, arranged in 25 rows of 40 characters each. Incoming characters are written on the bottom line of the display. When that line is full, an automatic line feed shifts all characters up one line—just like advancing the paper on a mechanical printer. The system responds to incoming line feeds, too so a full 72-character line is displayed as one 40-character line and one 32-character line. When all 25 lines have been used, the next line feed causes the top line to be deleted. The other lines are still there to review if you need to. For a complete description of the RVD-1002, see the April, 1972, issue of *RTTY Journal*, or April, 1973 *QST*.

Easy to Install

The RVD-1005 is simplicity itself to install. One shielded lead carries the teletype signal from your terminal unit. A second one supplies the video output signal to the monitor. Hook up these two cables, plug in the power cord, and you're ready to go. The input and output circuits are designed to match the ST-6 TU and common video monitor or TV set specs.

The RVD-1005 is shipped completely assembled and tested, ready for you to plug in and use. It carries HAL's one-year warranty against defects in materials and workmanship. All circuitry is constructed on two printed circuit cards and housed in an appealing two-tone grey cabinet designed to match the HAL ST-6 terminal unit (available in either desk-top or rack-mount models).

Specifications

Input Data Form:	Serial Baudot Code TTY Request data on the RVD-1005A for ASCII code
Input Data Level:	RS-232B or current sensing (both provided)
	RS-232B: -5 to -15 VDC Mark +5 to +15 VDC Space
	Current Sensing: Loop Compatible 18 to 120 ma Mark 0 to 2 ma Space
Composite Video:	1.0 V p-p, 75 ohm
Peak Video Bandwidth:	3.1 MHz
Size & Weight:	3½ H x 17 W x 12 D inches, 7.5 lbs.
Power:	105 - 125 VAC, 50 - 60 Hz 200 ma 210 - 250 VAC, 50 - 60 Hz 100 ma optional
	Specify table or rack mount cabinet (19" W) - RVD-1005T or RVD-1005R

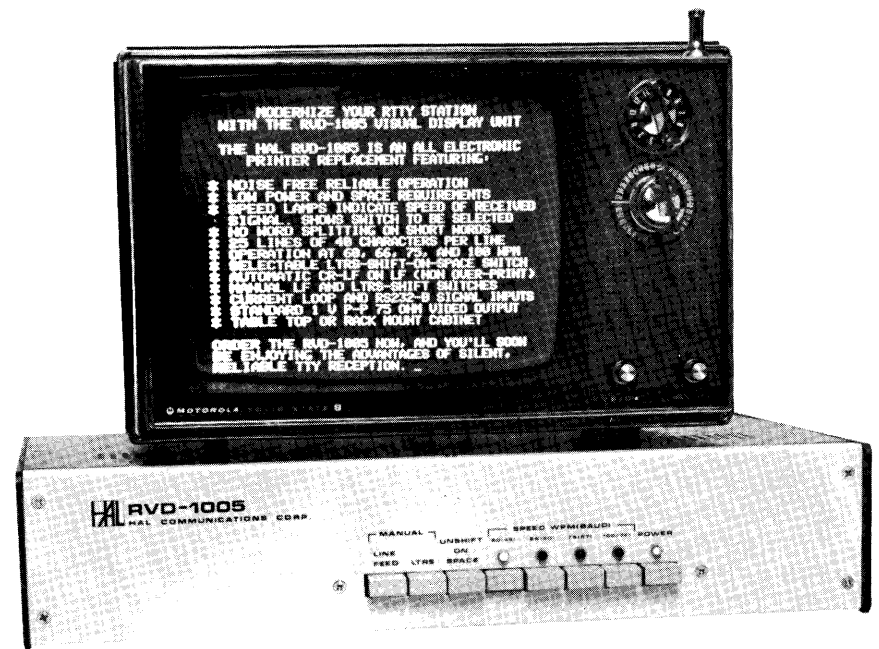
Monitors

Your own TV set can be readily modified to serve without interfering with its normal operation, or you can choose the RVD-2110 monitor, especially selected by HAL for use with the RVD-1005. It is a solid state set with 38 square inch screen (9 inch diagonal measure) and is equipped with a BNC connector for the video input signal. It operates from either 115V 60 Hz or from a 12 VDC 1A supply.

In addition, the RVD-2110 is a complete all channel TV with the new UHF detent tuner. A sun shade, earphone, and 12 VDC power cord with cigarette light plug included with the RVD-2110.

We can also supply broadcast quality video monitors in screen sizes of 9, 11, 14, 17, and 23 inch (diagonal measure).

Order your RVD-1005 now. You'll soon be enjoying all the conveniences that have made this visual display unit one of the hottest items in RTTY. Check the equipment price list for ordering information.



DEPEND ON HAL FOR THE LATEST AND BEST IN RTTY

From a sophisticated, all-electronic RTTY system, to accessories for your present setup, HAL brings you many of the most exciting developments in RTTY. Whether you're just starting in RTTY or getting ready to move up to more advanced gear, HAL has equipment to fit your needs and your budget. Take a look at the following pages and you'll see why HAL has the reputation for keeping you on top in RTTY.

RVD-1005 Visual Display Unit

You tune in a RTTY signal, press a button and instantly . . . silently . . . the characters start to appear on the screen of your video monitor or TV set. No paper piling up, no gears to oil, no mechanical adjustments to make—these are just a few of the conveniences that HAL's new visual display unit can bring to your shack.

The RVD-1005 is the second generation version of the HAL RVD-1002, the first visual display unit offered to the teletype operator. The features that have made the RVD-1002 so popular are retained in the RVD-1005, and some new features have been added. For example, the RVD-1005 offers

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