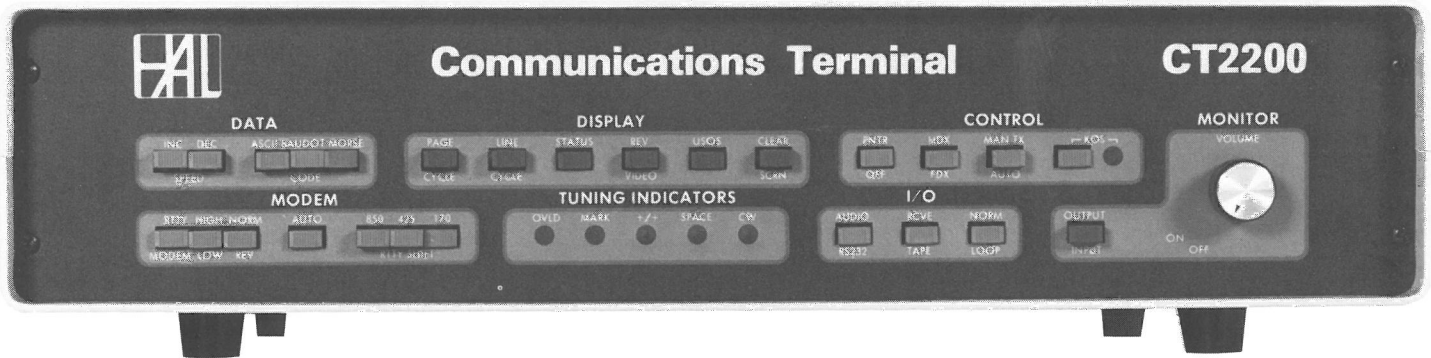




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# CT2200



The CT2200 is the successor to the popular CT2100 terminal from HAL. It is designed for reception and transmission of Baudot and ASCII Radioteletypewriter (RTTY) signals as well as Morse code signals. The CT2200 incorporates all of the features and conveniences of its predecessor, and has the additional features of selective call, programmable message or "brag tape" storage, and non-volatile memory. These new features are accessed through the optional KB2100 keyboard. A total of five data demodulators are available in the CT2200, including a CW demodulator, both high and low tone RTTY demodulators, and two standard modem tone sets for ASCII and computer use. All demodulator sections use the high performance circuitry for which HAL demodulators are well known. The display of the CT2200 is organized in 24-line pages that can be either 48 lines of 72 characters, or 96 lines of 36 characters. The display features "Smooth Scroll" of the lines rather than a vertical jump each time lines are moved on the screen. The normal display is light characters on a dark background but may be reversed with a front panel switch to present dark characters on a light background. A serial ASCII printer output port provides hard copy capability. This printer output can be controlled manually by a front panel switch, or automatically with a "selective call" code which the user programs in. The CT2200 has been specifically designed so that it may be used as a receive-only device or as a no-compromise send/receive terminal with the KB2100 Keyboard. All CT2200 controls are push-buttons on the front panel. There are no confusing multi-key combinations to remember while operating. Both the keyboard layout and physical design of the KB2100 put user convenience first. The KB2100 is small and light and attaches to the CT2200 with a flexible coil cord, making it ideal for comfortable lap-held use. Since the CT2200 is separate it may be placed on a shelf or rack mounted and only the keyboard need take up limited operating table surface. With the addition of the KB2100 keyboard, split screen transmit/receive operation is available so that transmit text may be composed while receiving. The CT2200 transmits in word mode if half duplex is selected and in continuous mode if full duplex is selected. Split screen may be defeated so that all lines on the screen are devoted to receiving. Eight messages, 7 of 256 characters and 1 of 158 characters, along with two "HERE IS" messages may be stored from the keyboard and recalled at any time. These messages are retained even when power is removed from the CT2200. A status line may be front panel selected to show current operating conditions on the top line of the display. The CT2200 will also interface to a wide variety of external equipment through transmit and receive audio connections, tape recorder audio connections and loop or RS-232 data connections. Tuning is facilitated through 6 LED's on the front panel and a video tuning bar on the screen. The rear panel is set up for fast and simple installation. Most connectors are standard phono connectors and are clearly labeled as to function. The CT2200 also includes I/O connections for operation with the ARQ1000 error correcting terminal.



# CT2200

## SPECIFICATIONS

### Input/Output:

Audio: 0.5v. p-p, 600 ohm audio  
Morse: 800 Hz  $\pm$  300 Hz  
RTTY: 1000-3000 Hz, depends on tones chosen.  
Tape: Input and output audio.  
Monitor: Monitor output jack paralleling internal monitor speaker. May be used for headphones.

RS232C:  
Loop: Full RS232C data levels for RTTY.  
18-120ma/200v maximum current loop.  
External loop supply required to use external loop devices.  
External loop transmit devices will key transmit tones and activate KOS.

Morse: Separate transistor switches to key both positive and negative voltage transmitter circuits.

### Data Codes and Rates:

RTTY: Baudot (5 unit code) or ASCII (8 unit code): 45, 50, 57, 74, 110, 150, 300, 600, or 1200 baud.  
Morse: 5 to 100 wpm, with weight control.

### Modem:

Morse: Phase-lock loop; 800 Hz nominal center frequency; may be adjusted over 400 - 1200 Hz range; tracks a drifting signal  $\pm$  250 Hz of center frequency.

RTTY: US Standard Mark = 2125 Hz  
"High Tones": Space = 2295 Hz (170 Shift)  
= 2550 Hz (425 Shift)  
= 2975 Hz (850 Shift)  
CW ID = 2025 Hz (all shifts)

IARU Standard Mark = 1275 Hz  
"Low Tones": Space = 1445 Hz (170 Shift)  
= 1700 Hz (425 Shift)  
= 2125 Hz (850 Shift)  
CW ID = 1175 Hz (all shifts)

"103 Modem" Mark = 1270 Hz  
Standard Space = 1070 Hz  
"202 Modem" Mark = 1200 Hz  
Standard Space = 2200 Hz

Transmit audio tone frequencies are automatically set with demodulator switches to correspond to receive tones to assure true transceive frequency matching.

### Display:

Video: Standard RS170, 1.0v. p-p, 72 ohm video output, 6 or 3 MHz BW

Screen: 24 Lines of 72 or 36 characters per line

Page Memory: 48 lines of 72 characters or 96 lines of 36 characters.

Polarity: Normal = white characters on dark screen background  
Reverse = dark characters on white screen background

Split Screen: WITH KB2100 ONLY - bottom 12 lines of page 2 may be chosen for display of transmit pretype text. Text may be typed, displayed, and edited while receiving. In split screen mode, transmit text is in reverse video when normal video is selected for receive text and vice versa.

Status: Top line of display may be used to indicate CT2200 and KB2100 status; tuning indicator bar, code, rate (speed), USOS, and TX buffer condition are included in status line.

Scroll: HAL "Smooth Scroll" of line feeds; inactive when split screen is selected.

### TX/RX Control:

Select transmission in full or half duplex (FDX/HDX) modes, synchronous idle (SYNC), and manual or auto control of transmit/receive status of transceiver, keyboard operated switch (KOS).

### Monitor:

Internal audio monitoring system allows monitoring of either input or output audio signals on the internal monitor speaker (or rear panel headphone jack) with front panel volume control. Input audio switch position allows listening direct to receiver or tape signal. Output audio switch position allows listening to 800 Hz sidetone in Morse or to RTTY tones to be transmitted in Baudot or ASCII.

### Indicators:

LEDs: Six LED indicators show Mark, Space, and center RTTY tuning; Morse center tuning, and KOS on-off status.

Screen: Top line of screen may be used for status indicator to show tuning bar for RTTY, code, rate (speed), USOS, and TX buffer condition.

Scope: Rear panel connections to vertical and horizontal amplifiers of X-Y RTTY oscilloscope for conventional crossed-loop indication (Oscilloscope NOT included with CT2200).

### Keyboard:

58 keys plus space bar, ASCII keyboard arrangement. Special CW ID (IDENT), two HERE IS, RUB OUT, and BREAK keys included. The HERE IS messages are user programmable. BREAK key sends key-down in Morse and Space condition in RTTY modes. RUB OUT allows error corrections. Highest quality commercial grade keyswitches are used for comfortable and reliable operation.

### Message Storage (with KB2100 only):

Two HERE IS messages and 8 longer user messages may be loaded from the keyboard. Maximum message lengths are: HERE IS 1-16 characters; HERE IS 2-36 or 72 characters; user messages 1 thru 7-256 characters; user message 8-158 characters. All messages retained when power is removed.

### Printer Output:

All received data may be printed on an external printer (available as an option). The printer output is serial ASCII, RS232C standard, at a data rate of 110 to 1200 baud (normally set for 300 baud). Printer operates regardless of received data code (Morse, Baudot, or ASCII), under manual or automatic control.

### Selective Call:

A special code of up to 8 printing characters may be used to automatically activate the printer output if desired. This code is programmed by the user and retained when power is lost.

### Front Panel Controls:

Data: Speed Increase, Speed Decrease, Mode selection (ASCII, Baudot, or Morse)

Display: Page cycle (to change pages), Line length cycle, Status line control, Normal or Reverse video, Unshift on Space, Clear Screen.

TX/RX Control: Full or Half Duplex, Synchronous Idle, Auto or Manual Transmit, KOS control, Printer control.

Modem: RTTY or Modem tone select, High or Low tone select, Autostart control, RTTY shift select (170, 425, or 850 Hz).

I/O: RS232 or Audio Source select, Receiver or Tape Audio Source select, Normal or Loop control of transmit tones.

Monitor: Output or Input audio tone monitoring selection, Volume of monitoring tone, Power on-off switch.

### Rear Panel Connectors:

Audio Input from Receiver, Audio Input from Tape, Audio Output to Transmitter, Audio Output to Tape, Monitor Audio Output, Mark and Space Scope Outputs, RS232 Input, RS232 Output, Loop Keyer Output, KOS Output, Negative and Positive CW Key Outputs, Printer Output, Video Output, KB2100 Keyboard connector, AC Power cord connector, ARQ I/O connectors.

### Mechanical Specifications:

CT2200 Cabinet: 16.75"  $\times$  3.625"  $\times$  10.375"  
(17.00" wide with rack mounts)  
42.55cm  $\times$  9.21cm  $\times$  26.35cm  
(43.18cm wide with rack mounts)  
16.0 lbs. net; 19.0 lbs. shipping  
7.3 kg net; 8.6 kg shipping  
Color: Light gray top and bottom with black front panel; red and blue push-buttons and front panel trim.

KB2100 Cabinet: 14.00"  $\times$  2.375"  $\times$  7.00"  
35.56cm  $\times$  6.03cm  $\times$  17.78cm  
4.5 lbs. net; 7.0 lbs. shipping  
2.0 kg net; 3.2 kg shipping  
Colors: Light gray top, dark gray bottom with black and white keytops.

Power Requirements: 110-130vac 50/60Hz; 220-260vac 50/60Hz; 30 watts



## OPTIONS

CT2200—Standard communications terminal.

KB2100—Accessory keyboard to allow typing of transmit text.

KG12—Recommended 12" monitor. P31 green phosphor CRT with removable smoked plastic screen cover. 120 VAC, 60 Hz, 39 Watts.  
Dimensions: 12.25" W  $\times$  12" D  $\times$  11.125" H, 16 lbs. net, 19 lbs. shipping.

RS2100—RTTY scope and loop supply for accurate tuning of received signals, and to drive mechanical printers.

RM2100—Rack mounting kit for CT2200. 1.5 lbs. net, 3 lbs. shipping.

ARQ1000—Automatic error correcting terminal.



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