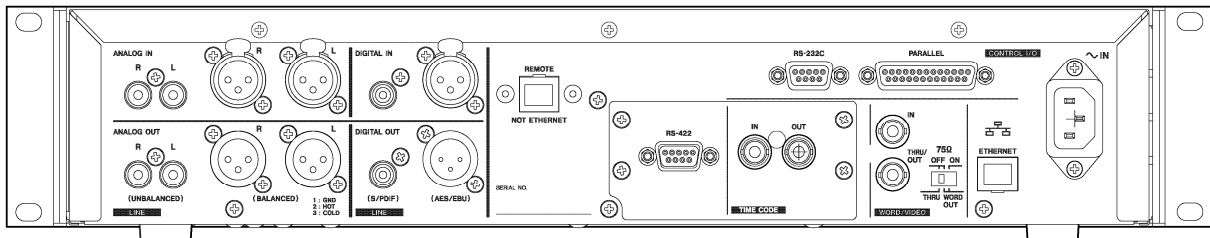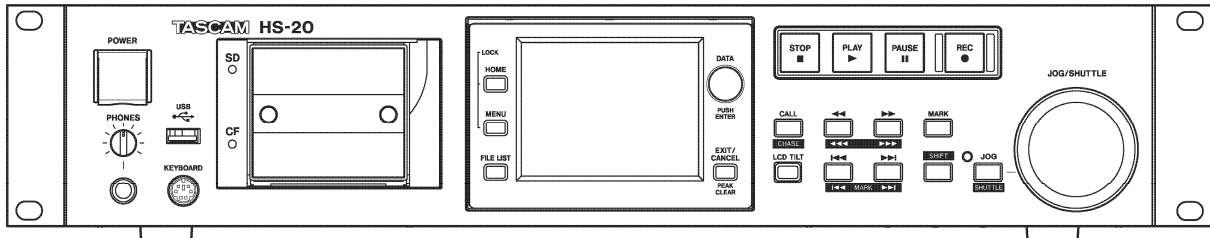Oct, 2014

Product Spec Sheet
2 Channel Audio Recorder
HS-20

■ Specifications
Audio resolution

・Recording media
SD/SDHC cards
CompactFlash (CF) cards

・File system
FAT32 (4 GB or more)
FAT16 (2 GB or less)

・File formats
BWF (Broadcast Wave Format)
WAV (Waveform Audio File Format)

・Number of channels
2 channels

・Quantization bit depths
16-bit, 24-bit

・Sampling frequencies
44.1/48/88.2/96/176.4/192 kHz

・Clock reference types
INTERNAL, WORD IN, VIDEO IN, DIGITAL IN

・Timecode frame rates
23.976, 24, 25, 29.97DF, 29.97NDF, 30DF, 30NDF

Inputs and outputs

Analog audio inputs and outputs

The error for nominal and maximum levels is ±1 dB or less for all input and output jacks except the **PHONES** jack.

・ANALOG IN L/R (BALANCED)

Connectors:	XLR–3–31 (1: GND, 2: HOT, 3: COLD)
Input impedance:	4.3 kΩ
Nominal input level:	+4 dBu (1.23 Vrms) ±1 dB
	(+6 dBu when maximum input level is set to +15 dBu)
	(+6 dBu when Digital Ref. Level is set to −9 dB)
Maximum input level (selectable):	+15 dBu (4.36 Vrms) (D.Ref: −9 dBFS, A.Input: +6 dBu)
	+18 dBu (6.16 Vrms) (D.Ref: −14 dBFS, A.Input: +4 dBu)
	+20 dBu (7.75 Vrms) (D.Ref: −16 dBFS, A.Input: +4 dBu)
	+22 dBu (9.76 Vrms) (D.Ref: −18 dBFS, A.Input: +4 dBu)
	+24 dBu (12.3 Vrms) (D.Ref: −20 dBFS, A.Input: +4 dBu)
	D. Ref: Digital Ref. Level setting
	A. Input: Analog Input Ref. Level setting.

・ANALOG IN L/R (UNBALANCED)

Connectors:	RCA pin jacks
Input impedance:	3.9 kΩ
Nominal input level:	−10 dBV (0.316 Vrms) ±1 dB
Maximum input level:	+6 dBV (2.0 Vrms) ±1 dB

・ANALOG OUT L/R (BALANCED)

Connectors:	XLR–3–32 (1: GND, 2: HOT, 3: COLD)
Output impedance:	100 Ω or less
Nominal output level:	+4 dBu (1.23 Vrms) ±1 dB
	(+6 dBu when Digital Ref. Level is set to −9 dB)
Maximum output level (selectable):	+15 dBu (4.36 Vrms) (D.Ref: −9 dBFS, A.Output: +6 dBu)
	+18 dBu (6.16 Vrms) (D.Ref: −14 dBFS, A.Output: +4 dBu)
	+20 dBu (7.75 Vrms) (D.Ref: −16 dBFS, A.Output: +4 dBu)
	+22 dBu (9.76 Vrms) (D.Ref: −18 dBFS, A.Output: +4 dBu)
	+24 dBu (12.3 Vrms) (D.Ref: −20 dBFS, A.Output: +4 dBu)
	D. Ref: Digital Ref. Level setting
	A. Output: Analog Out Ref. Level setting

・ANALOG OUT L/R (UNBALANCED)

Connectors:	RCA pin jacks
Output impedance:	100 Ω or less
Nominal input level:	−10 dBV (0.32 Vrms) ±1 dB
Maximum input level:	+6 dBV (2.0 Vrms) ±1 dB

・PHONES jack

Connector:	standard 6.3 mm (1/4") stereo jack
Maximum output level:	45 mW + 45 mW or more (THD+N 0.1% or less, into 32 Ω)

Digital audio inputs and outputs

・DIGITAL IN (S/PDIF)

Connector:	RCA pin jack
Input signal voltage amplitude:	200 mVp-p to 600 mVp-p/75Ω
Input impedance:	75 Ω
Formats:	AES3-2003/IEC60958-4 (AES/EBU)
	IEC60958-3 (S/PDIF)
Supported sampling frequencies:	44.1/48/88.2/96/176.4/192 kHz (Single/Double/Quad)
	When SRC is ON, the receivable range is 32-192 kHz.

・DIGITAL IN (AES/EBU)

Connector:	XLR-3-31
Input signal voltage range:	200 mVp-p to 10 Vp-p/110 Ω
Input impedance:	110 Ω ±20%
Formats:	AES3-2003/IEC60958-4 (AES/EBU)
	IEC60958-3 (S/PDIF)
Supported sampling frequencies:	44.1/48/88.2/96/176.4/192kHz (Single/Double/Quad)
	When SRC is ON, the receivable range is 32-192 kHz.

・DIGITAL OUT (S/PDIF)

Connector:	RCA pin jack
Output voltage:	0.5 Vpp ±20%/75 Ω
Input impedance:	75 Ω
Format:	IEC60958-3 (S/PDIF)
Supported sampling frequencies:	44.1/48/88.2/96/176.4/192 kHz (Single/Double/Quad)

・DIGITAL OUT (AES/EBU)

Connector:	XLR-3-32
Output voltage:	2-5 Vp-p/110 Ω
Output impedance:	110 Ω ±20%
Format:	IEC60958-4 (AES3-2003, AES/EBU)
Supported sampling frequencies:	44.1/48/88.2/96/176.4/192 kHz (Single/Double/Quad)

Control input/output ratings

・RS-422 (attached with optional SY-2 board)

Connector:	D-sub 9-pin (female, inch specification)

・RS-232C

Connector:	D-sub 9-pin (female, inch specification)

・PARALLEL

Connector:	D-sub 25-pin (female, inch specification)

・TIMECODE IN (attached with optional SY-2 board)

Connector:	BNC
Signal voltage amplitude:	0.5-5 Vp-p
Input impedance:	10 kΩ
Format:	SMPTE 12M-1999 compliant

·TIMECODE OUT (attached with optional SY-2 board)

Connector:	BNC
Signal voltage amplitude:	2 Vp-p
Output impedance:	600 Ω
Format:	SMPTE 12M-1999 compliant

·WORD/VIDEO IN

Connector:	BNC
Input voltage:	5V TTL equivalent (WORD IN)
Signal voltage amplitude:	1 Vp-p (VIDEO IN)
Input impedance:	75 Ω ±10%

Allowable frequency deviation of external synchronization:
　　　　　　　　　±100 ppm
Includes switch for enabling termination

Input frequencies (WORD):	44.1/48/88.2/96/176.4/192 kHz
Input signal (VIDEO):	24/25/29.97/30 Frame
	(NTSC/PAL Black burst, HDTV Tri-Level)

·WORD/VIDEO THRU/OUT

Connector:	BNC
Signal voltage amplitude:	5V TTL equivalent
Output impedance:	75 Ω ±10%
Output frequency (WORD):	44.1/48/88.2/96/176.4/192 kHz
	Frequency stability ±10 ppm or less (Ta = 20° C)
	OUT/THRU switch included (OUT is only for WORD OUT)

·ETHERNET

Connector:	RJ45
Compatibility:	100BASE-TX, 1000BASE-T

·KEYBOARD

Connector:	Mini-DIN (PS/2)

·USB

Connector:	USB A-type 4-pin
Protocol:	USB 2.0 HIGH SPEED (480 Mbps) compliant

·REMOTE

Connector:	RJ45
Supply voltage:	13 V
Signal:	LVDS serial

Audio performance

·Frequency response

ANALOG IN to ANALOG OUT:
　　20 Hz − 20 kHz: ±0.5 dB
　　　　(Fs = 44.1/48 kHz, JEITA) (recording and playback)
　　20 Hz − 40 kHz: +0.5 dB/−2 dB
　　　　(Fs = 88.2/96 kHz, JEITA) (recording and playback)
　　20 Hz − 80 kHz: +0.5 dB/−5 dB
　　　　(Fs = 176.4/192 kHz, JEITA) (recording and playback)

・**Distortion**

ANALOG IN to ANALOG OUT:　　　0.005% or less（JEITA）
（recording and playback）

・**S/N ratio**

ANALOG IN to ANALOG OUT:　　　100 dB or more（JEITA）
（recording and playback）

General

・**Power**

AC 100–240 V, 50–60 Hz

・**Power consumption**

22 W

・**Dimensions（W × H × D）**

482.6 x 94 x 314.1 mm（including protrusions）

・**Weight**

4.7 kg

・**Operating temperature range**

5–35℃

PARALLEL connector

The **PARALLEL** connector on the rear panel allows external control of this unit.（A TASCAM RC–SS20 can also be connected.）

The pin assignments are as follows.

Pin No.	Normal	RC–SS20 PonMode	I/O	Pin No.	Normal	RC–SS20 PonMode	I/O
1	GND	GND		14	REMORT_SELECT,H or Open	REMOTE_SELECT,L	I
2	PLAY	FLASH 1	I	15	PAUSE	FLASH 6	I
3	STOP	FLASH 2	I	16	(Reserved)	FLASH 7	I
4	RECORD	FLASH 3	I	17	AUX1, FF	FLASH 8	I
5	SKIP FWD	FLASH 4	I	18	AUX2, REW	FLASH 9	I
6	SKIP BWD	FLASH 5	I	19	AUX3, MARK	FLASH 10	I
7	(Reserved)	STOP	I	20	(Reserved)	FLASH_PAGE	I
8	FADER_START	FADER_START	I	21	(Reserved)	(Reserved)	O
9	(Reserved)	(Reserved)	O	22	TALLY_SD	TALLY_SD[1]	O
10	TALLY_PAUSE	TALLY_PAUSE	O	23	(Reserved)	(Reserved)	O
11	TALLY_ RECORD	RESERVED	O	24	TALLY_CF	TALLY_CF[2]	O
12	TALLY_STOP	TALLY_STOP	O	25	+5V[3]	+5V[3]	
13	TALLY_PLAY	TALLY_PLAY	O				

I: Command input for transport control

　　Internal circuit, +5V pull–up

　　Triggers from a low input level of 50 msec or more

O: Command output, for tally output

　　The internal circuit is open collector

　　（10Ω output impedance）

　　Low command output when operating

　　20V dielectric strength, 35mA maximum current

1 For RC–SS20, assigned to CF indicator

2 For RC–SS20, assigned to CD indicator

3 +5V: maximum supplied current is 50 mA

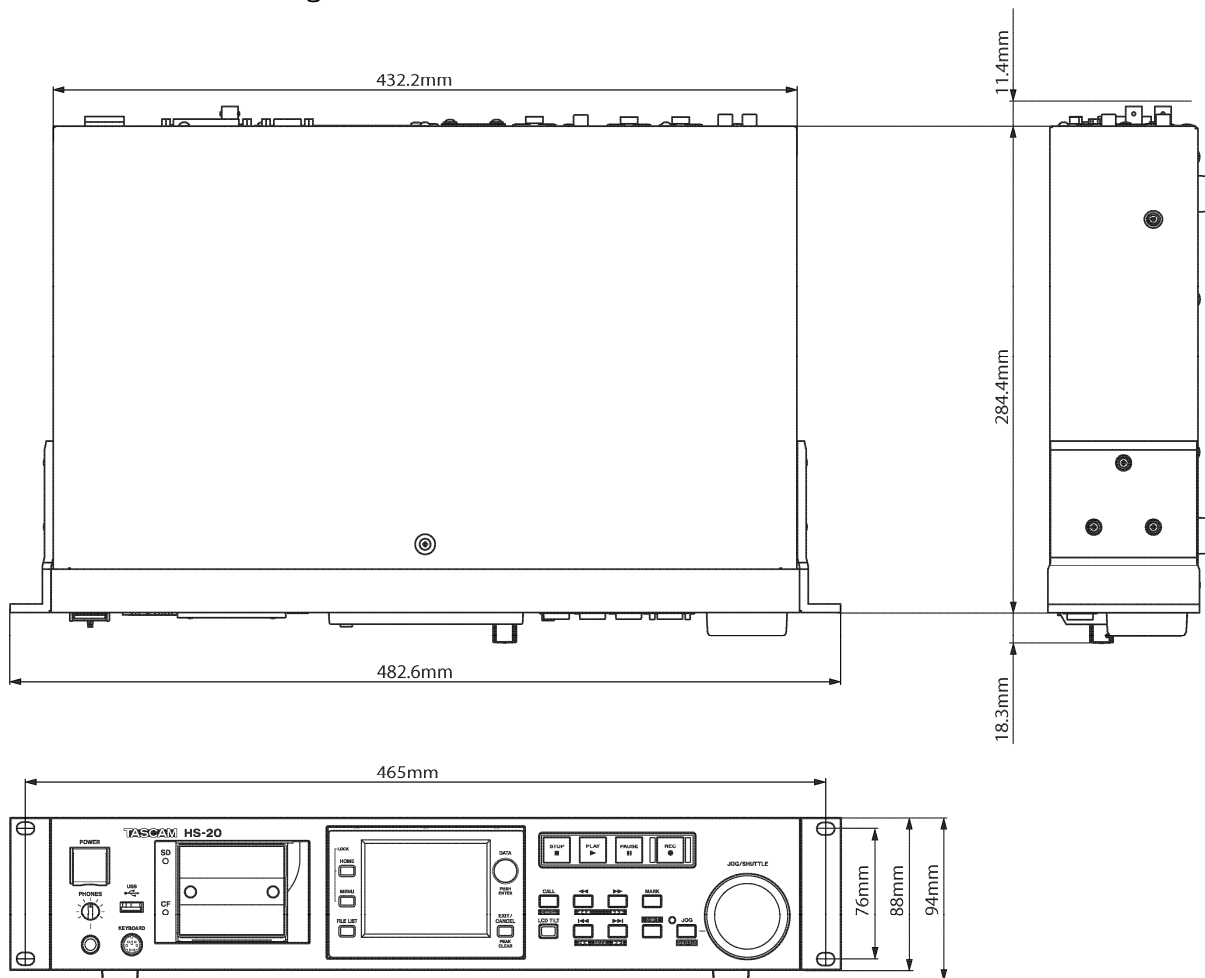When REMOTE Select (pin 14) is set to high, it can be used as an ordinary parallel controller.

When set to low, flash start mode is enabled.

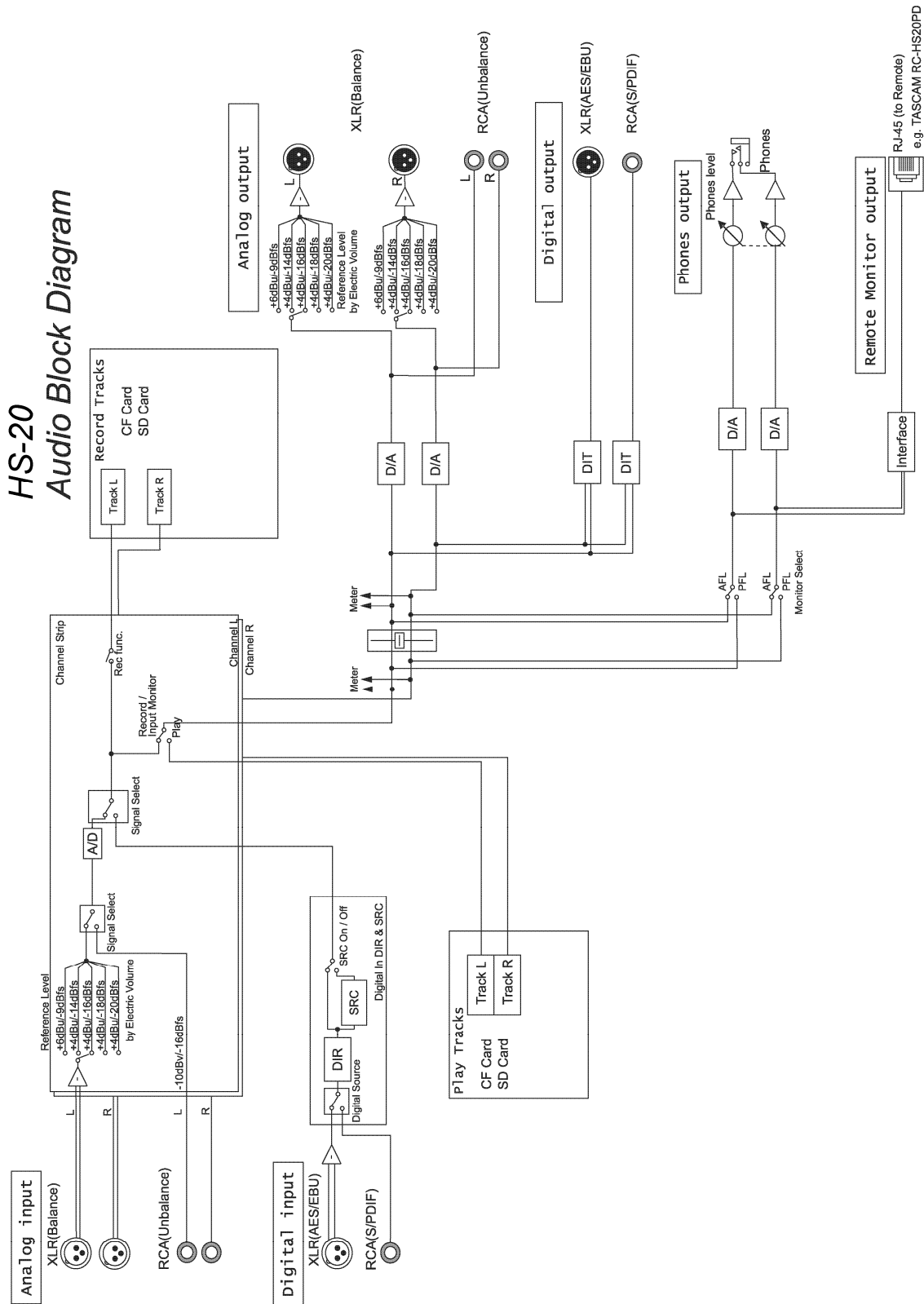In addition, depending on the high/low setting of the Flash Page (pin 20), the key assignments are as follows.

Pin 14	Pin 20	Flash start take
Low	High	1–10
Low	Low	11–20

■ Dimensional drawings

■ Block diagram

HS-20
Audio Block Diagram

Record Tracks
CF Card
SD Card
Track L
Track R

Analog output
XLR(Balance)
L
R
+6dBu/-9dBfs
+4dBu/-14dBfs
+4dBu/-16dBfs
+4dBu/-18dBfs
+4dBu/-20dBfs
Reference Level by Electric Volume

RCA(Unbalance)
L
R

Digital output
XLR(AES/EBU)
RCA(S/PDIF)

Phones output
Phones level
Phones

Remote Monitor output
RJ-45 (to Remote)
e.g. TASCAM RC-HS20PD

D/A
DIT
Interface

Meter
AFL PFL AFL PFL
Monitor Select

Channel Strip
Rec func.
Channel L
Channel R
Record / Input Monitor
Play
Signal Select
A/D
Signal Select

Reference Level
+6dBu/-9dBfs
+4dBu/-14dBfs
+4dBu/-16dBfs
+4dBu/-18dBfs
+4dBu/-20dBfs
by Electric Volume
-10dBv/-16dBfs

SRC On / Off
SRC
DIR
Digital Source
Digital In DIR & SRC

Play Tracks
CF Card
SD Card
Track L
Track R

Analog input
XLR(Balance)
L
R
RCA(Unbalance)
L
R

Digital input
XLR(AES/EBU)
RCA(S/PDIF)

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